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ABSTRACT

Part of a series of self-contained instructional units to teach Missourians how to use outdoor resources wisely and skillfully, this module of the Aquatic Skills Series introduces the basics of sport fishing using spin-casting equipment. The instructor may modify the module to meet the individual needs of class members based on age, experience level, and the time available. The material covers ethics, fisheries management, casting, special casts and situations, knowledge of fish and their surroundings, bait and lure selection, fishing skills other than casting, basic first aid for sport fishing, and cleaning and preparing the catch. The discussion is illustrated with black and white drawings. The basic information is organized into 14 50-minute class presentations, each with a purpose, methodology, necessary instructional aids and facilities, an outline of the presentation, appropriate exercises, and a final skill test. Student Handout pages are included that may be reproduced by instructors for classroom use. A glossary, bibliography, and four activities complete the manual. (ERB)

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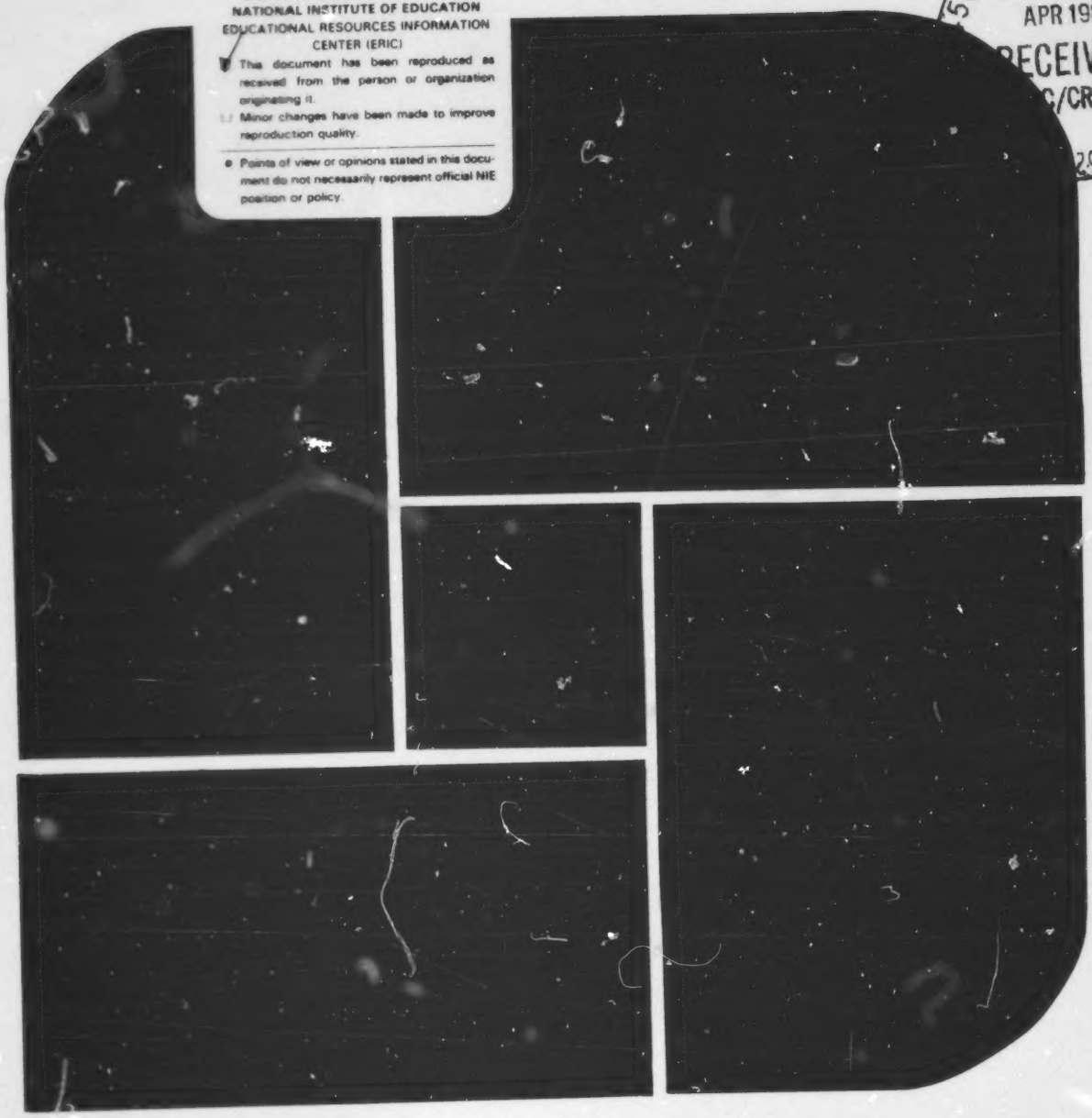

# BASIC FISHING

## AQUATIC SKILLS SERIES

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A PROGRAM OF THE MISSOURI DEPARTMENT OF CONSERVATION

# OUTDOOR SKILLS EDUCATION MODULES

Missouri's natural resources belong to all its citizens. More and more people are going outdoors to hunt, fish, boat, hike, camp, explore, and learn about nature. The skills they use in the outdoors can have a direct effect on resources. That's why it is important to educate youth and adults in how to use the outdoors wisely and responsibly through schools, community groups, and agencies.

The Outdoor Skills Education Unit of the Department of Conservation, in cooperation with the Department of Elementary and Secondary Education, is developing educational programs to teach Missourians how to use wisely and skillfully the state's many resources for outdoor recreation. The materials, presented as modules, can be used individually or combined in a series by schools, camps, clubs, scouting groups, and other youth or adult organizations. Topics include the shooting sports, casting and angling, trapping, archery, backpacking, camping, aquatics, map and compass, and other skill areas.

Each module is a self-contained unit that includes information on the subject, lesson plans, activities, class exercises, tests, suggested visual aids, and references. Experienced instructors who have taught the subjects and successfully used the activities have written the modules.

For additional information on conservation and outdoor education programs, write the Education Section, Missouri Department of Conservation, P.O. Box 180, Jefferson City, MO 65102.

INSTRUCTOR MANUAL

# BASIC FISHING

## AQUATIC SKILLS SERIES

MISSOURI DEPARTMENT OF CONSERVATION
EDUCATION SECTION

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## About the author

Bob Staton has been an Outdoor Skills Education Specialist for the Missouri Department of Conservation since August 1978. Before that he taught and coached at DeKalb High School in northwest Missouri. While at DeKalb he instituted and taught an outdoor skills class in addition to teaching junior and senior high physical education.

Bob holds B.S.E. and M.S.E. degrees from Central Missouri State University. As a graduate assistant at CMSU, he created and taught a graduate-level course entitled "Casting and Angling Instruction." He also has taught casting and angling at state and regional outdoor education workshops for the past 10 years.

Bob has been an avid Missouri angler for the last 29 years. He lives in California, Missouri, with his wife, Debbie, and three sons, Michael, Thad, and David.

## How to use this module

This module is designed to be used in a beginning sport fishing class. Instructors can modify it to meet the individual needs of their class based on age, experience level, and the time available. Information on selecting and maintaining spin-casting equipment can be found in the *Casting Equipment* module.

The *Basic Fishing* module can be used independently or in conjunction with any or all of the modules in the series on casting and angling. The *Basic Fishing* module starts at the point where spin-casting equipment is selected and builds from that point to the knowledge and skills required to properly use the equipment to successfully enjoy fishing.

*Editor's Note:*
*Modules now available in the Aquatics Skills series are* ***Casting Equipment*** *and* ***Basic Fishing****. Those still to be published include* ***Advanced Fishing, Fly Fishing, Fishing Without Rod and Reel,*** *and* ***Making and Repairing Fishing Equipment****.*

In the *Casting Equipment* module, the history and development of rods, reels, lines, and sport fishing are reviewed. The information in this module is designed to help students make wise choices in selecting the casting equipment best suited for their individual needs.

The *Advanced Fishing* module, when published, will cover fishing with spinning and bait-casting equipment. It also will cover in more detail some of the strategies and techniques involved in locating fish and enticing them to bite.

The whole realm of catching fish using fly fishing equipment will be covered in the *Fly Fishing* module.

The module entitled *Fishing Without Rod and Reel* will deal with the methods of sport fishing such as trotlining, limbling, and jugging which do not involve a rod or reel. The *Making and Repairing Fishing Equipment* module will cover the techniques of building and repairing various fishing equipment. It will deal with rods, reels, and other pieces of fishing tackle and will include a section on how to make artificial lures. How to tie flies, other than those covered in the *Fly Fishing* module, also will be included.

**Review committee**

The material in this module has been reviewed by the education section administration, outdoor skills education specialists, and a review committee comprised of the following people:

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# Introduction

**Purpose and goals of the module**

More than 60 million Americans go fishing each year, making this sport one of the most popular activities.

Those who enjoy the sport of fishing contribute to it financially through an excise tax on the fishing equipment they purchase. Funds from these taxes now help support a nationwide aquatic education program. This module has been developed with the following goals in mind for national programs:

1. To promote an understanding of water quality and public responsibility toward aquatic resources.
2. To cultivate a code of ethics and responsibility among aquatic resource users.
3. To enhance the public's understanding of fishery management, including regulations, and aquatic lifeform identification.
4. To provide the learner with a basic understanding of aquatic lifeform environmental needs and the intricate balance of this need to the use of the resource.
5. To reduce fishing related accidents and promote aquatic safety.
6. To improve the student's skills in the use of fishing equipment to produce more responsible aquatic resource users.

This module can be used in conjunction with instructional units to be produced by the Conservation Education Unit. Those planned for future publication include *Fisheries Management, Pond Management, Fish Identification,* and *Aquatic Ecology.*

**Content**

The Basic Fishing module is the second in the Aquatics Skills series. It introduces the basics of sport fishing using spin-casting equipment. Included is information on fisheries management, ethics, basic skills and strategies, and fish identification. A glossary and bibliography are provided for additional reference.

The material is organized into 14 50-minute presentations. Several appendixes are included that can be reproduced for student handouts.

**Objectives**

Upon completion of the instruction, students should be able to do the following:

1. Name two factors that affect whether or not there is good fishing in this state.
2. List five fisheries management programs of the Department of Conservation.
3. Describe how fishermen help provide financial support for fisheries research and programs.
4. Describe how water quality affects fish populations.
5. List three causes of water pollution in Missouri.
6. Explain the importance of good fishing ethics.

7. Demonstrate how to use the *Wildlife Code of Missouri* to look up a regulation.

8. Explain the role casting plays in successful sport fishing.

9. Demonstrate how to properly operate a spin-casting rod and reel for casting.

10. Explain the mechanics of casting.

11. Explain the importance of casting safety.

12. Cast safely.

13. Demonstrate the correct fundamentals of the overhand cast for accuracy.

14. Hit a 30-inch diameter casting target at least 1 out of 10 casts at a distance of 40 feet using the overhand cast for accuracy with spin-casting equipment.

15. Demonstrate the correct fundamentals of the lob cast.

16. Explain when to use the lob cast.

17. Identify at least five of the common Missouri sport fishes.

18. Explain and demonstrate how to use a sinker.

19. Explain and demonstrate how to use a bobber.

20. Explain and demonstrate how to rig a bait worm.

21. Discuss the techniques of rigging and fishing the common types of artificial lures.

22. Discuss the importance of common fishing tackle items and accessories.

23. Discuss fishing skills, other than casting, important to successful sport fishing.

24. Discuss basic first aid common to sport fishing.

25. Explain common methods of cleaning fish.

26. Discuss and/or demonstrate sidearm cast, flip cast, bow cast, pendulum cast, distance cast, two-hand cast.

27. Understand how to play plug golf.

28. Understand how to play practical casting.

## Ethics

In any sport you will encounter slobs: people who bend or break the rules and act in an irresponsible manner. The future of sport fishing can be insured by fishermen working together to educate and correct unethical or slob fishermen.

**Litter**

It's sad to say, but it is usually easy to tell if a body of water is being fished. The water and banks are all too often strewn with empty bait containers, pop and beer cans, plastic six-pack holders, discarded monofilament fishing line, and other forms of litter. There would be no problem if all fishermen properly disposed of their litter. Unfortunately, those who don't, give a bad name to everyone.

**Safety**

A responsible fisherman is safety conscious at all times. You should wear an approved life jacket or personal flotation device whenever you are in a boat. Even on the bank, you can fall in. Nonswimmers should always wear a personal flotation device whenever they are around water. Remember—always be conscious of water safety.

Casting safety should be second nature to a good fisherman. A needle-sharp hook can become a dangerous weapon if you are careless.

Keep safety in mind if your line becomes snagged. Most people's first reaction when a line gets hung in a tree or on a submerged snag is to jerk on the rod. If the line pulls free, the jig or lure can come hurdling back at you. Whenever you get snagged and have to try to pull your line free, alert everyone around you so they can move out of the way. Jerking on a snagged line should be a last resort only after all other methods have failed to free your line.

Boating safety is another important subject. If you are using a boat, be familiar with the state's boating regulations. Be prepared to handle all situations that might occur while using a boat. The Missouri State Water Patrol and the American Red Cross offer small craft safety courses for anyone interested in learning how to operate a boat.

Weather can change quickly in Missouri. A responsible fisherman will be prepared to handle sudden changes in weather. In warm weather, a light rain can be annoying; in cooler weather, it can create a dangerous situation of exposure or hypothermia. If rain is likely, a good raincoat or poncho is a necessity. Carry an extra garbage bag for an emergency situation: it can keep you warm and dry.

Lightning can be especially dangerous for fishermen. If you are in a boat and an electrical storm develops, come ashore immediately and seek shelter. On land, never seek shelter under tall trees: trees attract lightning.

Fishing safety, like all kinds of safety, involves using good common sense and being prepared.

## Landowner relations

*Always obtain permission before fishing on private property.*

The vast majority of Missouri fishing waters are on private lands. This makes it important for fishermen to maintain good relationships with landowners.

As a responsible fisherman, you should always obtain permission before fishing on private land. To not do so may result in the pond or stream being closed to all fishermen, not to mention your running the risk of being arrested for trespassing.

Always respect private or public property. A considerate way of saying thank you for the privilege of fishing is to share your catch with the landowner. By being responsible and polite, you can insure a place to fish for years to come.

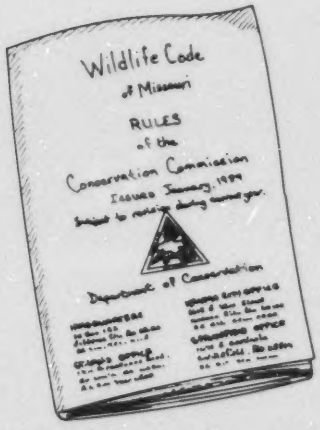
## Sportsmanship

Sometimes a good public fishing area will get crowded. As an ethical fisherman, you should never crowd or move into another fisherman's territory. Crowding is unsafe and unethical.

As was mentioned earlier, noise can cause fish to stop biting. Shouting, screaming, loud music, and other loud noise can make you very unpopular with your fellow fishermen. After all, part of the attraction of fishing is the quiet, peaceful setting it offers.

Simple courtesy can go a long way in fishing as well as everyday life.

## Laws and regulations




*The Wildlife Code of Missouri, published every January, lists all the fishing regulations. Ignorance of these laws is no excuse.*

***How to measure a fish to determine if it is within a legal length limit:** Measure the total length of a fish from the tip of the snout to the end of the tail with the fish laid flat, mouth closed, and tail lobes pressed together.*

The Wildlife Code of Missouri, the Conservation Department's official publication of rules and regulations, calls for persons over 15 and under 65 years of age to possess a fishing permit. Exceptions provide that a Missouri landowner, as defined in the Code, and his family may fish on the land they own without permits. For other exceptions, check the most current Wildlife Code.

Be aware of all fishing regulations before going fishing. Regulations involve many different aspects of fishing. Limits, seasons, permits, methods, and other regulations are made to help fishermen, not hurt them. These regulations are all part of the fish management plan of the state of Missouri. The Missouri Department of Conservation is working to insure that Missouri will always have good quality fishing available for everyone.

Creel limit laws help to insure equal opportunity for all people to enjoy Missouri's fishing resources. They also help insure that a body of water's fish population won't be reduced too drastically.

Seasons allow fishermen to harvest fish without upsetting spawning or reproduction of the species.

Length limits are set to improve the quality of our fishing resource and allow the fish a chance to grow and make use of available food sources.

Regulations pertaining to fishing methods help insure that fishing remains a sport and not simply a harvest.

The sale of fishing permits helps to cover the costs involved in fisheries management and research and hiring



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conservation agents to enforce the regulations. When fishermen obey the regulations they are helping to insure the future of quality sport fishing.

If you have questions about fishing regulations, either check the Wildlife Code or contact your conservation agent. Ignorance of the law is never an excuse.

**Conservation**

Missouri is blessed with many streams, rivers, ponds, and lakes. The future of fishing in our state depends on our water resources. We must maintain a high enough quality to support Missouri's more than 200 species of fish.

Clean water conservation is the responsibility of everyone and especially those who fish and want future generations to be able to enjoy the sport of fishing.

Water is polluted by industrial wastes, sewage, siltation from soil erosion, and poor agricultural practices. Along with pollution, the unwise damming of streams and rivers can hurt the fisheries resource. The right to vote is an important weapon against unwise water resource practices. Concerned fishermen should study issues involving water resources and cast an informed vote.

Conservation has been defined as "wise use without waste." This means using our fisheries resource wisely and not wasting it. If you keep more fish than you can use, you are wasting the resource. Fish taken home only to be thrown away also are wasted. Keep only what you can use and use what you take home. If you enjoy sport fishing, you don't have to keep all or any of the fish you catch. Catching and properly releasing fish can provide hours of enjoyment while still conserving the resource. The many pleasures of just goin' fishin' can never be measured.

# What Makes For Good Fishing?

**A brief look at fisheries management**

**Note to instructor:**
*More detailed information on fishery management will be available in an instructional unit to be published by the Department's Conservation Education Unit in 1985. Contact your conservation education consultant for information.*

## HISTORY

Fishing has always been a popular sport for Missourians. Even in 1937, the first year of the then newly formed Missouri Conservation Commission, 260,656 people bought fishing licenses (in 1983, 519,994 people purchased fishing permits).

Over the years, the concept of what is good fisheries management and the role of the Department of Conservation's Fisheries Division have changed. In the 1930s fisheries management centered around the idea of stocking fish to insure good fishing. A statewide system of hatcheries and rearing areas were operated to produce fish. From 1939 to 1941, the Fisheries Section began to concentrate on habitat problems, such as poor land use, which can lead to the filling in of streams. The section stressed that fish planting alone was not the answer to good fishing but that increasing food supply of fishes was more important. From 1944 to 1947, hatcheries were operated only for stocking new waters and for corrective stocking. Since 1948, hatchery production has become an integral supplement to sound fisheries management which includes habitat improvement and construction of new fishing waters.

In the 1950s the Department began encouraging landowners to build farm ponds and embarked on its own program of public fishing lake construction. Fisheries management practices were expanding.

Today the Department of Conservation has active programs in education, research, lake and stream management, water quality investigation, warm and cold water hatcheries, introduction of new species, public use areas and stream access development, and regulations and wildlife law enforcement. Goals of the Fisheries Division include restoring and developing aquatic habitat, providing recreational opportunities, and insuring species diversity which includes studies on such non-game species as mussels. The Division also sponsors Kids Fishing Day programs and stocks ponds for fishing clinics. Fifteen fisheries management biologists perform management duties throughout the state. The efforts of these and many other professionals in the Department have helped to insure that there are excellent fishing opportunities in Missouri.

## POND MANAGEMENT

**Note to instructor:**
*A Missouri Pond Handbook is available by writing the Department of Conservation, P.O. Box 180, Jefferson City, MO 65102. The Conservation Education Unit will be producing an instructional unit on pond management. Contact your conservation education consultant for information.*

Fish in farm ponds require intensive management due to a delicate predator-prey balance. Department of Conservation personnel work with pond owners in managing their ponds. Most farm ponds are considered ready to fish two years after stocking; the time lag insuring spawning activity prior to harvest. Failure by pond owners to follow management suggestions generally results in dissatisfaction and the need to renovate a pond and begin anew.

## FEDERAL FUNDING

In 1950 John D. Dingell, Sr. and Edwin Johnson helped enact the Federal Aid to Fisheries Bill, commonly called the Dingell-Johnson (or D-J) Act. Fishermen actively supported the bill, which put an excise tax on fishing equipment with the funds being allocated to the states for fisheries research, management programs, and acquisition of public access sites and lakes. By putting up 25 percent of the cost for a project, states can receive 75 percent federal funds.

In July, 1984, President Reagan signed a new bill to add items to D-J, which further increases funds for fisheries work and provides money for fishing education programs throughout the nation. The new bill changes the name from D-J to Wallop-Breaux, after Senator Malcolm Wallop of Wyoming and Representative John B. Breaux of Louisiana, who played an important role in amending the D-J Act.

**Water quality**

Good fishing depends upon more than sound management. Any lowering of water quality has prolonged effects on both fish populations and fishing success. Pollution has made inroads on the recreational opportunities associated with fishing. Major water pollution sources in Missouri include municipal and industrial discharge, mine drainage, agricultural chemicals and siltation from the mismanagement of lands adjacent to streams and lakes.

Some pollutants affect only the smallest aquatic life, while others, such as acid drainage from mining operations, may cause sudden and certain death to all forms, including the desirable game fish. The offensive taste of some fish from the Missouri and Mississippi rivers is caused by pollution, and has contributed to a decline in commercial fishing.

The mishandling of lethal agricultural products has been a contributing fish killer in Missouri in recent years. Certain summer and winter conditions which cause a depletion of oxygen in the water can kill fish by suffocation.

Stream channelization in the name of flood control, or for navigational purposes or extensive drainage, has had an impact on fish habitat. Studies in Missouri and other states indicate tremendous cutbacks in the fish population of a stream which has been channelized. Other forms of modern expansion and technology have resulted in warm water discharge into Missouri waters, and these are being watched closely for detrimental effects on fish.

When a pollution-caused fish kill occurs, personnel of the Department of Conservation and water quality investigators are promptly on the scene to assess the damage and determine the source of pollution. Polluters may be taken to court by either the county prosecutor or the state's attorney general and fined for polluting the stream and killing fish illegally.

## Standard Casts

*Note to instructor:*
*All directions for casting in this module refer to right-handed casters. Simply reverse the directions for left-handers.*

Successful fishing can be divided into two main parts: effective casting and knowledge of the fish being pursued.

The skill of casting can be learned by study and practice. The knowledge of fish and how to entice them to bite is best learned through experience. The beginner, therefore, should first concentrate on learning to cast.

### Plug casting

The ability to cast is like any other skill: proficiency comes only after learning the fundamentals and then practicing to perfect them. To be a successful fisherman, the basics must be practiced until they become second nature.

The skill of casting can be divided into three major categories: (1) accuracy, (2) distance, and (3) versatility.

*Learning to cast accurately decreases your chances of getting "hung up."*

**ACCURACY**

Accuracy is the most important category, but distance and versatility should not be slighted. Accuracy, of course, is the ability to cast a plug or bait to the spot you want it to land. The ability to read a body of water and determine where the fish are is useless unless you can get the plug or bait to that spot. Many times, the best fishing spots are not in open water, but rather around structures such as trees, rocks, or man-made features such as boat docks. The ability to cast to these spots without getting "hung up" is what accuracy is all about.

**DISTANCE**

Distance is an important skill, but should be practiced only after an acceptable level of accuracy has been achieved. Many times beginners will strive to see how far they can cast. Again, distance without accuracy is useless! First learn accuracy; then work on distance.

Distance is an important part of accuracy. The ability to judge the distance to a target and then cast that distance is critical to accuracy. When casting toward a shoreline, the ability to judge distance can mean the difference between catching a big bass or catching a big tree limb.

Casting for long distances is a skill that is not often needed. Most fish are probably caught between 20 to 60 feet from the fisherman. However, occasionally a situation may require a longer cast. The ability to cast for distance involves only a few modifications of the accuracy fundamentals. These fundamentals will be discussed following the completion of learning how to cast accurately.

**VERSATILITY**

The third category involved in the skill of casting is versatility. Successful fishermen must be versatile casters. They must be able to cast lures and baits of all sizes and weights.

In most skills involving accuracy, you strive for consistency. This is much easier when the object, such as a

baseball, bowling ball, or dart, always weighs the same and is shaped the same. Fishermen don't have this luxury; their baits and lures are as varied in weight and shape as are the fish they are seeking.

When practicing accuracy and consistency, you strive to always perform the fundamentals exactly the same. This is not always possible if you are fishing. When fishing, you must be able to cast from a standing or sitting position; from rocky shorelines, bouncing boats, open water; and from beneath tree limbs.

*Fishing from a bouncing boat adds to the challenge of making accurate and consistent casts.*

Without a doubt, versatility is an important part of a fisherman's ability to cast effectively. Versatility, like accuracy and distance, can be learned through practice. This can be accomplished by varying the weight of your practice plug, the distance you are casting, and the particular style cast you use.

The key to successful casting is practice! You don't need a river, lake, or pond to practice. All you need is a rod, reel, practice plug, and a yard.

**PRACTICE**

Practice plugs are available in all shapes and sizes at most stores that handle fishing equipment. The best kind are made of rubber and have a metal eye for attaching the line. Without the metal eye, the fishing line will quickly cut through the eye of the plug making it useless.

It's best to buy several practice plugs of different weights: they are commonly found in 1/4-ounce, 3/8-ounce and 5/8-ounce sizes. Practicing with different weights will help you obtain versatility along with accuracy and distance.

*Practice plug*

Once you have a practice plug and have studied the correct fundamentals, actual practice can begin. A good way to practice is to roam around your yard or a park and pick out targets to cast at: a tree, a leaf, a rock can all be potential targets. One thing you must keep in mind is even though the practice plug is rubber, it can be dangerous. Never cast toward people or a house. Rubber practice plugs can cause eye injuries and break windows.

*The key to successful casting is practice.*

The old saying "practice makes perfect" is true, but unless you first learn the proper way to cast, you are only making yourself better at doing something wrong.

There are many types of casts used by fishermen.

## Spin-casting

*Note to Instructor:*
*The parts and adjustment on spin-cast reels, such as drag and anti-reverse, are covered in the Casting Equipment module. These should be discussed before the casting instruction begins.*

Several of the more useful casts being used today with spin-cast reels will be discussed in the following pages.

### GRIP

The first step in casting a spin-cast reel is to grip the rod and reel properly. Grip the rod handle with your right hand with the forefinger in front of the rod handle trigger. Rotate your hand counterclockwise so that the reel handle is on top. Make sure that the reel handle is on top, not at the side.

The reel is cast with the reel handle up for two main reasons: first, so that the line does not slap the rod; second, for maximum wrist flexibility.

When the line slaps the rod it creates friction which can affect the accuracy and distance of the cast. With the reel held properly, the only thing the line contacts is the rod guides.

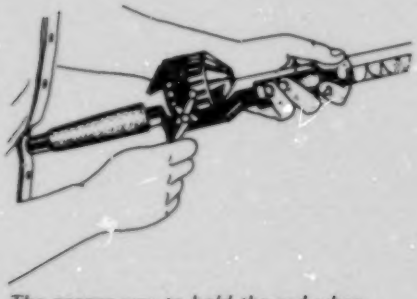
With the proper grip, the wrist functions better: the correct position is less tiring to the wrist and provides better accuracy.

Next, aim the rod at the target and perform a back cast. The wrist motion in spin-casting is very similar to that used in throwing a dart. The aiming method and back cast used will depend on the type of cast you are using. These will be covered individually in the section on the different types of casts.

After the back cast, bring the rod forward toward the target and raise the thumb from the button allowing the line to cast off the spool. This step involves timing and coordination. If the button is released too soon, the result will be a high arcing cast. If the button is released too late, the cast will be short.

*Releasing the button too late can cause your cast to be short.*

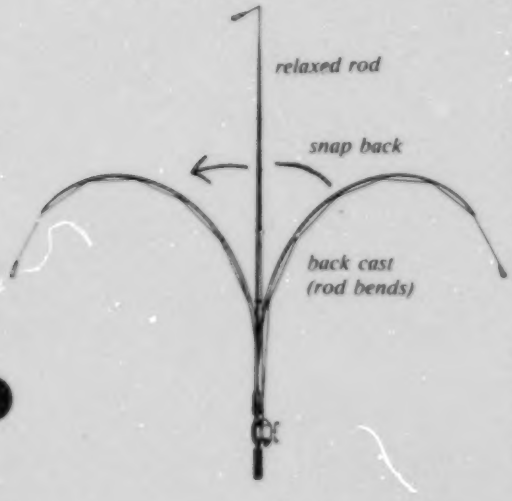
*The technique of feathering the line.*



*The proper way to hold the rod when retrieving.*

*Gently pinch the line as you retrieve it.*

**The mechanics of casting**




**DISTANCE**

Once the plug is in the air, any adjustment right or left is difficult to master. This is why you should point the rod at the target as the plug is cast.

There are two main methods to adjust the distance of the plug while it is in the air. If the plug appears to be going too far, depress the button to slow the plug. To stop the plug completely, fully depress the button and allow the plug to drop on the target.

In the second method, use the left hand to grasp the rod, in front of the reel, with the thumb and forefinger above the rod. Place the thumb and forefinger around the line and gradually pinch the line to slow the plug. Pinch the line firmly to stop the plug so it drops on the target. This method is called "feathering."

Once the plug is in the air there is no way to lengthen the cast. This is why most good casters cast with enough force to allow the plug to travel beyond the target and then slow the plug and stop it so it falls on target. This method also allows the plug to drop with less force which is important when a lure is being used to imitate a live bait.

**RETRIEVE**

Once the cast is complete, the next step is the retrieve. To start the retrieve, grasp the rod in front of the reel with the left hand, just like when feathering the line. Then, place the rod butt against the navel or just above the waist. Grasp the reel handle with your right hand and turn it forward to retrieve the line. As the line is retrieved, the rod should be held straight in front of you at about a 45-degree angle pointing up.

During the retrieve, gently pinch the line with the thumb and forefinger of the left hand as in feathering the line. This serves to clean the line and keep debris from entering the reel. It also allows the line to be reeled back on the spool with even pressure which will ensure smooth casts.

Expert casters use a variety of techniques. However, even with all these different techniques, two things must always happen: First, to get distance the rod must bend. Second, to get accuracy all variables must be eliminated. These principles apply to all kinds of casting: fly-casting, spinning, spin-casting, and bait-casting.

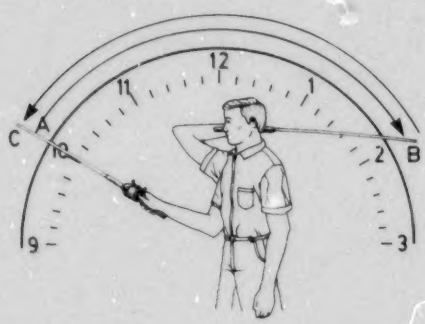
When the mechanics of casting are studied, you find the reel itself is not really the key to good casting. Of course, a smooth, trouble-free reel is important, but the real key to good casting is the rod and the wrist and arm action of the caster.

In order to be a good caster, it is necessary to master rod handling fundamentals. Once these fundamentals are learned, both accuracy and distance will come easily.

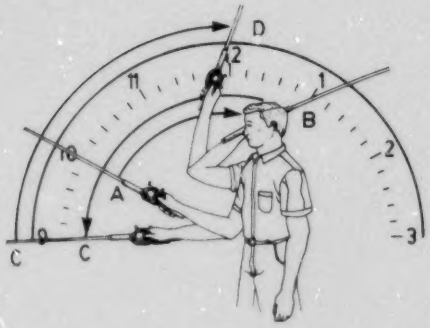
The first mechanical principle of casting is that the more the rod bends, the more distance you will get. A relaxed rod

*The rod represents the minute hand on the face of a clock.*

*One-stroke cast*




*Two-stroke cast*




*A to B to C cast for medium action rods*
*C to D cast for light action rods*

is naturally straight. When casting forces it to bend, it will try to return to a straight condition—in other words, "snap back." This snap back produces motion and speed to a fishing lure which creates the cast. Therefore, the farther a rod is forced to bend, the farther and faster it will snap back.

In describing various casts in this module, the face of a clock will be used as a point of reference. The caster will be in the center of the clock face with his waist in line with the 9 o'clock and 3 o'clock positions and his head facing 9 o'clock. The rod will represent the minute hand.

**ONE-STROKE CAST**

The simplest or most basic casting technique is the single stroke. In this technique, let the plug hang behind you. Bring the rod forward quickly and release the plug when the rod reaches the 10 o'clock position. (Due to the inertia of the plug, the rod will bend as it is brought forward.) When the forward motion of the rod is stopped, the rod will snap back straight, thus casting the plug. In this technique the plug is held stationary prior to casting.

**TWO-STROKE CAST**

The most commonly used and recommended casting technique is the two-stroke cast. The two-stroke cast applies to spinning, bait-casting, and spin-casting.

In the two-stroke technique, start at the 10 o'clock position. Back cast the plug to 1 or 2 o'clock, then bring it forward without hesitation and cast. The back cast serves to pull more bend into the rod. It follows that the faster the plug is traveling backward, the more it will bend the rod when the direction is reversed. However, since this technique of back-and-forward movement of the rod accentuates the bend in the rod, it is no longer desirable to bring the rod all the way back to 3 o'clock. To make a good two-stroke cast, start the plug traveling backward before you reverse direction and come forward.

The back cast position depends somewhat on the strength of the caster and the stiffness of the rod. For most fishermen, light action rods may only need to be back cast to 12 o'clock, while medium action rods may need to be back cast to 1 o'clock. Stiff action rods may need to be back cast to 2 o'clock, but never back cast any further than 2 o'clock while using this technique.

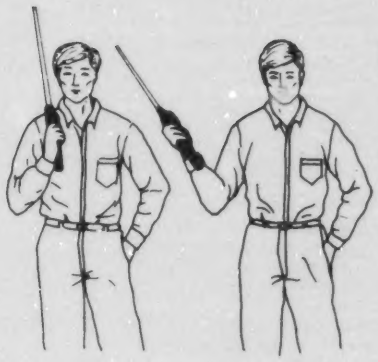
This 10 o'clock to 1 o'clock and back to 10 o'clock technique is good for beginners. The rod is in an almost vertical position at all times. As you gain experience, you will gradually start altering this technique, probably without even knowing it. Your back casting arc will change from a 10 o'clock to 1 o'clock arc to a 9 o'clock to 12 o'clock arc. This results in a flatter trajectory cast with less margin for error. This technique, although more effective, is advanced and very difficult for a beginner to do unless he or she first learns and practices the 10 o'clock to 1 o'clock technique.

## ACCURACY

The rod techniques discussed thus far have dealt with achieving distance. As stated earlier, to achieve accuracy, the variables must be eliminated. The most common variables are the point the plug is released at and the vertical angle of the rod.

When practicing, always try to duplicate perfect casting form. The plug should always be released smoothly and at the same place in the casting arc. The release of the plug must be a reflex action and must happen quickly. This reflex is acquired through practice. To achieve accuracy, focus with your eyes on where you want the plug to land and the reflex release of the plug will become automatic.

Another variable which affects accuracy is the vertical angle of the rod. Keep the rod as near vertical as possible along the plane of the cast and throughout the cast. This will eliminate any side-to-side variables. The best way to achieve this is to always hold the rod in front of your body in a vertical plane in front of your right eye. The rod must remain perfectly vertical during the back cast and the release. This will ensure the plug will always be in direct line with the target.



*right* *wrong*

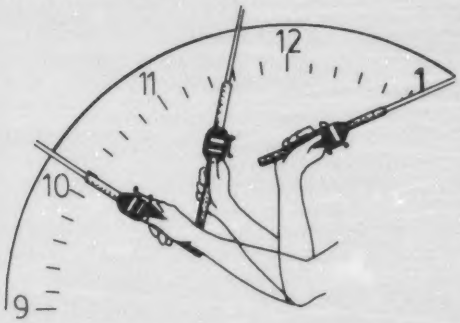
*Safety tip:*
*An ultra-light spinning rod with parabolic action would be dangerous to use by starting the cast in front of the face since the lure could hit the caster in the back of the head. A safer technique would be to cast 10 o'clock to 1 o'clock and back to 10 o'clock with the rod held in a vertical plane along the side of the head, rather than in front of the face.*

## ARM AND WRIST ACTION

Arm and wrist action are just as important to accurate casting as rod control. The best rule of thumb in this area is do what feels natural, while maintaining rod control. Most good casters will develop, through practice, a wrist and arm coordination that suits them best. The method described is the best technique to teach a beginner. After practice, this method may be altered to what feels most natural.

For beginners, the arm and wrist action really only involves moving the wrist and forearm. Use your wrist and forearm to pull the rod back into the back cast. The forearm will move from 10 o'clock to 12 o'clock. The wrist at this point bends backwards so the rod goes to the 1 o'clock position. To complete the cast, move the forearm down to 10 o'clock and snap the wrist forward to 10 o'clock. Notice that the upper arm does not move in average distance accuracy casts. The large muscles in the upper arm are used, but the upper arm itself does not move.

The mechanics of accuracy described above have been for the overhand cast. As other casts are explained, the mechanics will remain the same but the rod and arm and wrist action will change. However, throughout the section on casting, the two important keys to remember are that rod control and good arm and wrist action are absolutely essential for any level of accuracy.




*Move the forearm from 10 o'clock to 12 o'clock, then bend the wrist and rod back to 1 o'clock. To complete the cast, move the forearm down to 10 o'clock and snap the wrist forward to 10 o'clock.*

**Overhand cast for accuracy (two-stroke cast)**

*Proper stance*

*Proper grip with wrist rotated*

## STANCE

The first fundamental of the overhand cast for accuracy is the stance. As in most skills involving accuracy, the stance is important. Shotgun shooters have a saying referred to as "missing with your feet." This means a target was missed because of a flaw in the shooter's foot position or stance. The same holds true in casting for accuracy. The caster's foot position or stance greatly affects the accuracy of a cast.

The stance is really quite simple. Stand with your feet about shoulder width apart, facing the target with the right foot slightly forward, supporting most of the body weight. The position of your right foot should be placed so that if a straight line were drawn from your foot to the target, it would bisect the target.

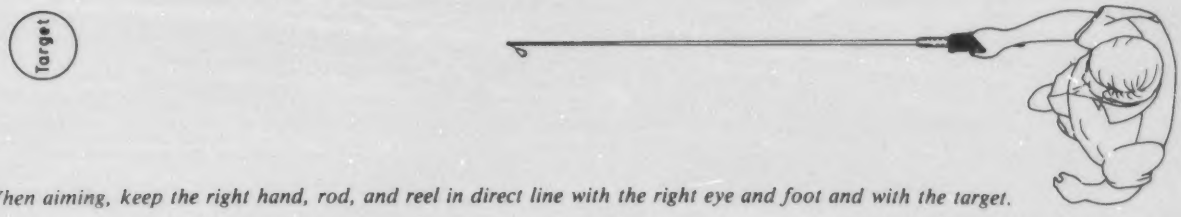
## GRIP

The next fundamental is the grip. As was stated earlier in the section on how to cast a spin-cast reel, grip is important in achieving accuracy.

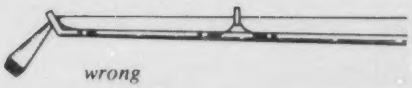
Grip the rod handle with the right hand with your forefinger in front of the rod handle trigger. Rotate your hand counterclockwise so the reel handle is on top. Position your thumb on the spool release button.

## AIMING

Properly aiming a cast is a fundamental that is often forgotten or not discussed. It is, however, as important in casting as it is in shooting a rifle.




*When aiming, keep the right hand, rod, and reel in direct line with the right eye and foot and with the target.*



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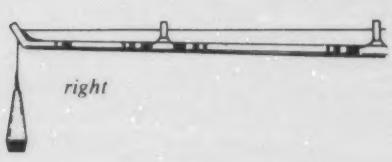
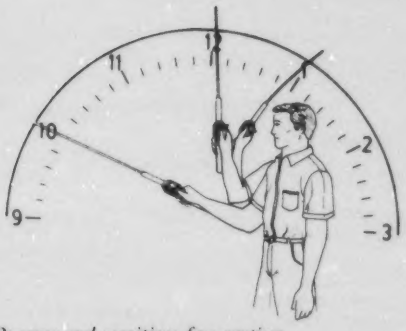


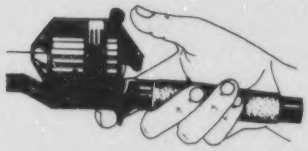
*right*

To aim a cast, first depress the spool release button with the right thumb and raise the rod to the 10 o'clock starting position. The right hand, rod, and reel should be in direct line with the right eye and foot and with the target. This places the rod and lure in a natural line to the target. Keep your eyes focused on the target during the entire cast. (It is important to note here that the cast should begin with the plug hanging about one-inch below the tip guide.) Do not hold the plug against the tip guide: this can cause excessive wear to the guide, and create friction which can affect accuracy.

When using a very light lure and a stiff rod, the plug may need to start by hanging it a foot or more below the tip guide. This serves to increase distance, but also cuts down on accuracy. The best rule of thumb is to start with the plug hanging one inch below the tip guide, then experiment. If more distance is needed, increase the starting distance from




*Proper rod position for casting.*



*Release the spool release button to release the line.*

*Don't use the overhand cast under a tree limb.*

the plug to the tip guide in one-inch increments until the desired distance is obtained. Just remember, the farther the plug starts from the tip guide, the harder it will be to achieve accuracy.

**CASTING**

As soon as the rod is aimed, the back cast can begin. First depress the spool release button and hold it. Then pull the rod straight back from the 10 o'clock starting position. Stop the forearm at the 12 o'clock position and the wrist and rod at the 1 o'clock position. This completes the back cast. To complete the cast, bring the forearm, wrist, and rod sharply forward to the 10 o'clock position without a fraction of a second's hesitation from the back cast.

**RELEASE AND FOLLOW-THROUGH**

Once the forearm, wrist, and rod reach the 10 o'clock position on the forward cast, release the spool release button with your thumb and allow the plug to travel toward the target. As the plug is released, the arm may follow through to about the 9 o'clock position.

**FEATHERING**

At this point, locate the airborne plug and start judging how far it will travel. If left alone, the plug should travel beyond the target. Then feather the line to adjust the cast so it will drop on target.

**WHEN TO USE**

The overhand cast is one of the most accurate and easiest to perform. It's probably used by more fishermen than any other cast. Use this cast anytime the conditions allow. Don't use it when an overhead obstacle, such as a tree limb, would prevent a proper back cast.

The overhand cast should always be the first cast a beginner learns. Once this cast is perfected, other casts can be practiced.

**Sidearm cast**

The sidearm cast has two big disadvantages: it is not as accurate as the overhand cast and it can't be used in a boat or near other fishermen.

**STANCE**

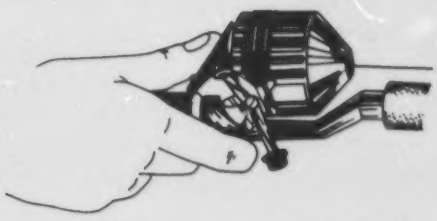
The stance in the sidearm cast is exactly like that used in the overhand cast for accuracy (see diagram page 26 ).

**GRIP**

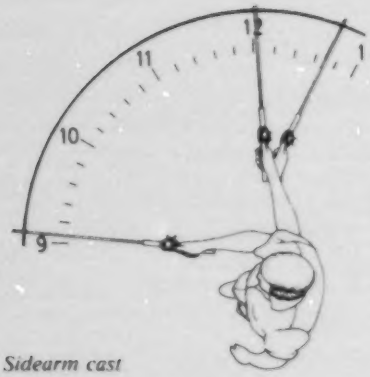
The grip in the sidearm cast is like that used in the overhand cast with one exception. The hand and reel are not rotated. The reel remains upright with the handle on the side and not on top as in the overhand cast.

**AIMING**

Aiming for the sidearm cast is done exactly like the overhand cast, except again, the reel is held upright, not rotated.



*The hand and reel are not rotated in a sidearm cast.*




*Sidearm cast*

**CASTING**

In describing this cast using a clock face, it is important to note that the caster is now standing perpendicular to the clock face and not parallel as in the overhand cast.

Begin this cast with the forearm, wrist, and rod back cast from 9 o'clock to 12 o'clock. The wrist and rod carry on to 1 o'clock. Next, without hesitation, bring the wrist, rod, and forearm back to 10 o'clock and release the button with your thumb to cast the plug.

**FOLLOW-THROUGH**

As the plug is cast, the wrist, forearm, and rod should carry forward to the 9 o'clock position.

**FEATHERING**

While the plug is airborne, feather the line exactly as you did in the overhand cast.

**WHEN TO USE**

As was previously stated, the sidearm cast for accuracy has several disadvantages. However, there are special situations when this cast can be helpful and is one more trick in a fisherman's bag to be called upon when needed.

## Special Casts and Situations

Special casts are sometimes used by fishermen when they find themselves in special situations while fishing. If all fishing were done on open water or open shorelines, the overhand cast would be the only cast needed. However, fishing often requires the fisherman to seek out water that contains a lot of structure such as overhanging tree limbs, rocks, or man-made structures. These special situations often require special types of casts.

As was mentioned in the section on plug casting, the three major components of casting are accuracy, distance, and versatility. Good casters must be versatile: they must be able to cast from rocky shorelines, bouncing boats, beneath tree limbs, and any other situation they incur while fishing. Versatility is the reason good fishermen take the time to learn special casts.

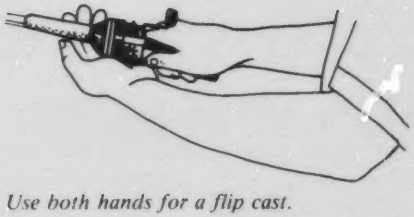
### Flip cast (two-stroke cast)

The flip cast is one of the most versatile casts. It allows you to cast in a wide variety of situations. Once learned, it also is a very accurate cast. The flip cast is best performed on a medium action rod, but can be modified to use on light or heavy action rods.

**STANCE**

The stance in the flip cast is the same as that used in the overhand cast for accuracy (see diagram, page 26).

**GRIP**



*Use both hands for a flip cast.*

The grip in the flip cast uses both hands. Grip the rod with your right hand as in the overhand cast. Then, rest the reel in the palm of the left hand while the right hand maintains the overhand grip. Keep both arms close to the body and the hands and reel approximately waist high and about 12 inches in front of the middle of the body. Hold the rod parallel to the ground or water.

**AIMING**

Aiming for a flip cast is quite simple. Hold the rod so it is pointing at the target, focus both eyes on the target, and depress the spool release button.

**CASTING**

The back cast in the flip cast is actually a down cast. The entire casting motion is accomplished by using *only* the right wrist. The arms do *not* move during the entire cast. Moving the arms is the most common error made by beginners. Arm action defeats the action of the rod and spoils the cast. The right wrist provides all the motion and the left hand acts as a fulcrum.

To begin the cast, depress the spool release button and hold it, raise the rod tip about 12 inches with the right wrist, then immediately snap the rod *tip* down sharply; this serves to bend or load the rod. Next, as the rod begins to

straighten, release the spool release button. The action of the rod casts the plug, the *arms do not*. The secret to this cast is timing. The spool release button must be released at the precise moment the rod begins to straighten. If the spool release button is released too early, the plug will drop in front of you. If it is released too late, the plug will go straight up or behind you.

**FOLLOW-THROUGH**

Complete the follow-through by holding steady. Do *not* move the rod or your arms.

**FEATHERING**

Once the plug is airborne, follow the plug with your eyes toward the target. Feathering is accomplished just as in the overhand cast.

**WHEN TO USE**

As was mentioned, the flip cast is extremely versatile. It can be used when overhead obstructions such as tree limbs prevent using the overhand cast. When used properly, a flat plug trajectory or flatter path will result. This cast is good for casting under structures such as tree limbs hanging over the water.

Once learned, this cast also is one of the most accurate because a fisherman can see and follow the plug during the entire cast. Because this cast is accurate, some fishermen use it almost exclusively.

Another advantage to learning the flip cast is that it can save fatigue on your arms if you plan to fish for long periods of time.

All-in-all, the flip cast is a versatile, accurate cast that is well worth the time to learn and perfect.

**Bow cast (one-stroke cast)**

The bow cast is another specialized cast that can add versatility to special situations. It can be a dangerous cast if done improperly and should never be attempted with bait or a lure before first perfecting it using a practice plug.

**STANCE**

The stance in the bow cast is exactly like that used in the overhand cast (see diagram, page 26 ).

**GRIP**

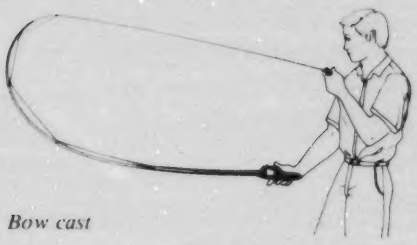
The grip in the bow cast is exactly like that used in the sidearm cast (see diagram, page 27 ).

**AIMING**

Aiming for a bow cast is quite simple. Hold the rod in front of your body in direct line with your right eye and point the rod directly at the target.

**CASTING**

The bow cast begins with the plug hanging 18 to 24 inches below the rod tip. Depress the spool release button with your right thumb and hold it. Grasp the plug with your left thumb and forefinger. Pull the plug back bending the



*Bow cast*

rod until the plug is near or directly over the reel. Set the drag on the reel tight enough so it doesn't slip at this point.

Once aimed, release the plug with your left hand. As the rod begins to straighten, it pulls the plug forward. As the plug starts forward, release the spool release button. Here again, timing is the key to success. If the spool release button is released too soon, the plug will fall at your feet. If the spool release is released too late, the plug will strike the ground or water sharply, only a few feet in front of you.

**FOLLOW-THROUGH**

To complete the follow-through, hold steady and don't move the rod or your arms.

**FEATHERING**

Once the plug is airborne, follow it with your eyes and feather the line in the same way as in the overhand cast.

**WHEN TO USE**

The bow cast can be used in special situations when no other cast will work; for example, in a brushy area along a bank when the overhand, sidearm, and flip cast would be impossible to use.

This cast also can be used to shoot a plug back under tree limbs or other overhanging structures.

The important thing to remember is never use it unless the lure or bait can be grasped safely behind the hook. Doing otherwise can result in jerking the hook or hooks deeply into your fingers.

## Lob cast (one-stroke cast)

Use the lob cast when fishing live or prepared bait. The other casts described tend to whip the plug sharply, and therefore, can whip the bait off the hook. The lob cast is a softer cast that will prevent losing the bait during the cast.

**STANCE**

The stance in the lob cast is exactly like that used in the overhand cast (see diagram, page 26 ).

**GRIP**

The grip in the lob cast is exactly like that used in the sidearm cast (see diagram, page 27 ).

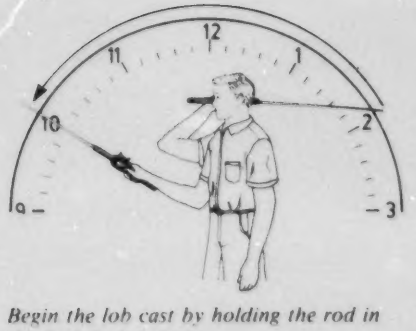
**AIMING**

When aiming the lob cast, concentrate both eyes directly on the target.

**CASTING**

The first step in the lob cast is to hold the rod in the 2 o'clock position. At this point, glance back at the hook to make sure it is not snagged on any structure behind you. Next, depress the spool release button and concentrate on the target.

With your right wrist and forearm, cast the rod forward to the 10 o'clock position releasing the spool release button and thus allowing the bait to be cast.




*Begin the lob cast by holding the rod in the 2 o'clock position.*

**FOLLOW-THROUGH**

The follow-through is accomplished by keeping the rod pointed at the target until the cast is complete.

**FEATHERING**

When the bait is airborne, follow it with your eyes. Feathering can be done the same as with the overhand cast.

**WHEN TO USE**

As mentioned, the lob cast is for casting live or prepared bait. It is a softer cast and is less likely to whip the bait off during the cast. It is about the only cast that can be used when fishing with a fixed bobber or float.

This cast is not as accurate as many of the other casts, but pinpoint accuracy is not as critical in fishing live or prepared bait as it is in fishing artificial lures. Since the majority of fishermen use natural rather than artificial bait, this is probably the most common cast used today.

**Pendulum cast**

The pendulum cast is used when only a short cast is called for and a conventional cast would not be necessary. It is basically the same cast used as when fishing with a cane pole. This type of cast recently has gained popularity with bass fishermen who refer to this technique as "flippin."

**STANCE**

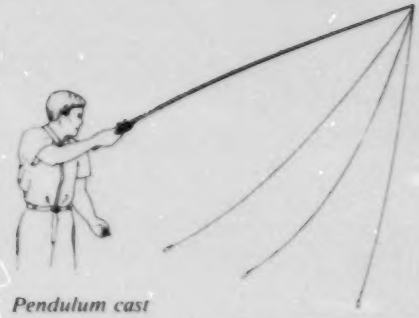
The stance in the pendulum cast is exactly like that used in the overhand cast (see diagram, page 26).

**AIMING**

To aim the pendulum cast, hold the rod in direct line with the target and concentrate both eyes on the target.

**CASTING**

The pendulum cast begins with the plug hanging at least the length of the rod below the rod tip. Hold the rod in the 11 o'clock position. Grasp the line in front of the reel with your left hand and pull it back to your left side. Depress the spool release button and begin to swing the plug forward and backward in a pendulum fashion with your right wrist. Once the plug nears the top of its forward arc, release the line with your left hand and allow the weight of the plug to pull it forward. If more distance is needed, release the spool release button. Bring the rod tip down to the 9 o'clock position as the plug is cast.



*Pendulum cast*

**FOLLOW-THROUGH**

The follow-through is accomplished by keeping the rod tip pointed directly at the target.

**FEATHERING**

Once the plug is airborne, follow it with your eyes to the target. Feathering, if needed, can be done as it is with the overhand cast.

**WHEN TO USE**

Use the pendulum cast when a short cast is called for

and a conventional cast is not necessary. By nature of the short distance involved, this cast is very accurate.

**RETRIEVE**

The retrieve in this cast can be done in several ways. If the cast is no further than the length of the rod, raise the rod tip to the 11 o'clock position to retrieve the plug. If the cast is only 3 or 4 feet further than the length of the rod, grasp the line with your left hand and pull it to the left side of your body as the rod tip is raised to 11 o'clock. If the cast is further, use the conventional retrieve by turning the reel handle, or use any combination of these retrieves.

**Sitting casts**

*Sitting cast*

Many fishermen like the comfort of sitting while fishing, either on land or in a boat. All of the casts described can be done while sitting. The only major modification is the stance.

When casting from a sitting position, try to point your body squarely toward the target. This, with practice, will help you achieve the same level of accuracy as when standing.

The key is practice. Most people only practice casting while standing. This is fine if all your fishing is done standing. However, if you occasionally fish while sitting, you should spend part of your practice time casting from a sitting position.

**Casting for distance**

Casting for long distances in fresh water fishing is usually not necessary. However, sometimes an occasion arises when a cast of more than 80 feet is called for: the overhand, sidearm, flip, or bow cast can all be used in this instance. Increased distance can be achieved by applying the mechanics involved. As was mentioned, the most important thing to remember about casting for distance is that the more the rod bends, the more distance you can achieve.

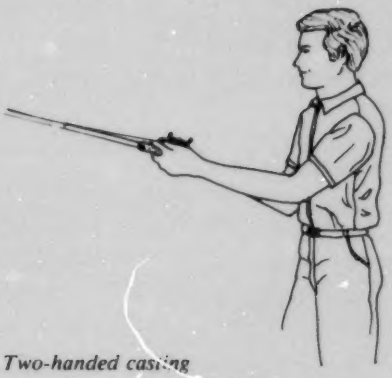
Getting more bend in a rod can be accomplished in two ways: One way is to increase wrist and arm action during the cast. Another way is to use a heavier plug or weight.

You also can use a lighter action rod, but if you do, be careful not to get your tackle unbalanced. A plug that is too heavy for a light rod can over bend it and actually shorten the casting distance. The importance of balanced tackle can't be emphasized too much and is covered in more detail in the *Casting Equipment* module.

Distance, like accuracy, involves practice. Distance casting can and should be practiced, but only after an acceptable level of accuracy has been achieved.

**Two-hand casting**

Many people follow the same basic fundamentals as mentioned for the overhand and sidearm casts except they use a two-hand grip. In this position, the left hand grasps the rod just in front of the reel and helps provide some of the power. This technique is fine, and in the case of some youngsters, is necessary because of their lack of strength.



*Two-handed casting*

Casting two-handed also makes the left hand readily accessible for feathering. A disadvantage, however, is that it tends to make pinpoint accuracy more difficult to achieve. The thing to remember is to do what comes naturally and feels most comfortable to you.

If you study expert casters, you'll find no matter how varied their individual styles, they all share the same basic fundamentals and principles that have been described.

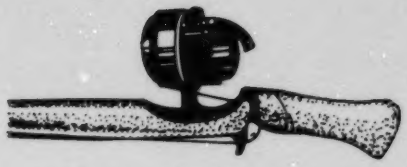
It is a good idea to learn to cast both right-handed and left-handed. A prolonged fishing trip can result in a lot of casts. The ability to cast with either hand can save wear and tear on your arms. It also adds more versatility.

Casting a lure or bait accurately has been, and always will be, an important part of successful sport fishing. It is a skill that is accomplished by correctly learning the basic fundamentals and then taking the time to practice and perfect them. The practice time will be rewarded with many enjoyable hours of safe, trouble-free fishing.

**Casting safety**

Casting safety is important at all times. Casting a plug or bait follows the same principles as firearms safety. You are responsible for your plug or bait from the time you begin the cast until the time you retrieve the plug or bait.

The first safety rule is always look behind you before you start a back cast. Make sure no one is behind you and that no obstacles will interfere with your back cast. You must always look around and beyond your intended target and make sure there is no chance that your plug or bait will hit someone. Never cast toward another person.



*To free a snag, wrap the line around the rod and then pull on the rod handle, not the line, so you don't cut your fingers.*

Freeing snagged lures or bait is also part of casting safety. If the plug is out of reach and the only way to free it is by pulling on the line, never grab the line directly. Monofilament line can cut your fingers like a knife. If you must pull, wrap the line two or three times around the rod handle and pull on the rod handle, not the line.

When pulling on a snagged line, the lure may pull loose and come toward you at a high rate of speed. To avoid getting hit, never pull directly toward you. Hold the rod out to one side and pull. Also, alert anyone around you before you begin to pull so that they can avoid getting hit by the lure should it pull free.

Casting safety, like all kinds of safety, involves using good common sense. Keep in mind, no fish or lure is worth someone getting hurt or taking a dangerous chance.

## Knowledge of Fish and Surroundings

The second key to successful fishing is knowledge of the fish being pursued. If you know a fish's habits and habitat, you will know where you will most likely find that fish and what lure or bait you'll need to entice it into biting. As you pursue certain species of fish, you will learn important things like what effect time of year, time of day, and weather have on the habits of the fish. Hunters have always known and practiced this principle: they learn as much as possible about the deer, turkey, squirrel, or other game that they are pursuing. By knowing the habits and the habitat of the animal, they are more likely to encounter it.

Another point fishermen can learn from hunters is that they just don't go hunting game, but instead concentrate on one particular game species at a time. Fishermen that concentrate on one particular species of fish at a time greatly increase their chances of success. In other words, simply casting a gob of worms into a hole of water and trying to catch anything that swims by will produce some fish; however, rigging your tackle and picking a spot and time of day for a particular species of fish will produce more fish. This doesn't mean you can't fish for more than one species of fish on a fishing trip. You may get up early and fish for largemouth bass, then fish for crappie during the day, fish for bass again that evening, and then fish for channel catfish that night. What it does mean is that you should concentrate on one species at a time, using your knowledge of that species' habits and habitat to increase your catch.

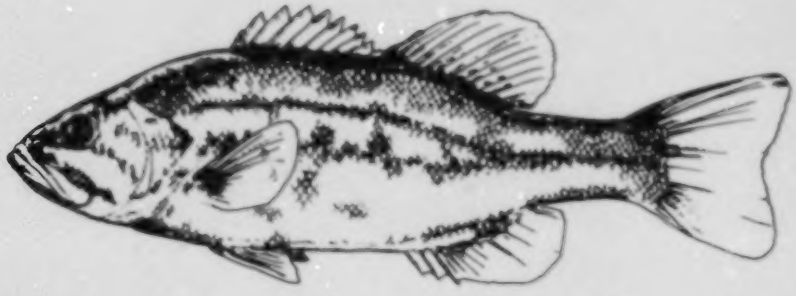
Another bit of knowledge you should have besides habits and habitat is the anatomy of fish. Anatomy will guide you in identifying the fish you catch. This is important so you can obey the laws pertaining to limits and seasons.

*Editor's note:*
*Information for this section has been adapted from the book* ***Fishes of Missouri*** *by William Pflieger. It is available from the Department for $7.50 in soft cover or $10 in hard cover. The fish drawings for this section were drawn by Martha Daniels.*

### ANATOMY, HABITS, AND HABITATS

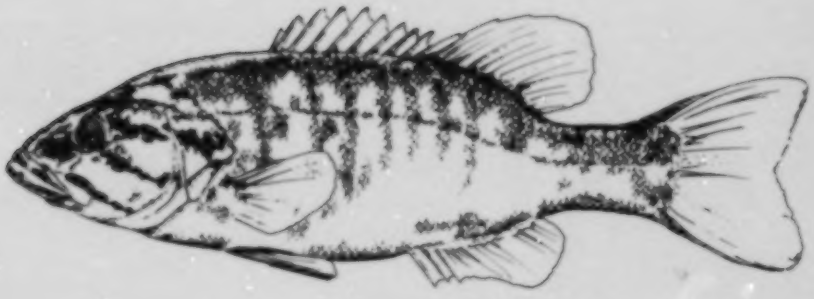
In this section, some of the more popular species of fish found to be abundant in Missouri waters will be described.

### SUNFISH FAMILY
### Black Basses



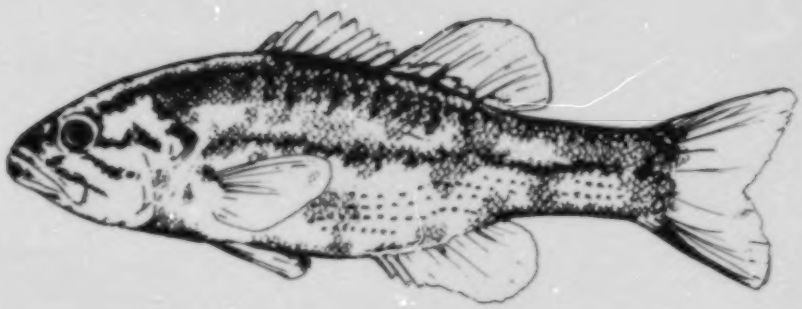
**Largemouth Bass**
*Micropterus salmoides.* Wide ranging.

The largemouth is the largest member of the sunfish family and the most abundant bass in Missouri lakes and slow-moving streams. The largemouth bass has always been popular with fishermen, but in recent years it has become the most popular freshwater game fish in the United States. Often confused with the smallmouth and spotted bass, it is distinguished by its large mouth extending beyond the rear edge of the eye, and side markings which generally appear as a broad, continuous stripe. Young bass feed on small insects; adults eat insects, crayfish, and fish. Adults weigh about 2 pounds and are about 15 inches long at 5 years of age.



**Smallmouth Bass**
*Micropterus dolomieui*. Ozark region. (Sometimes referred to as bronzeback, brown bass, and tiger bass.)

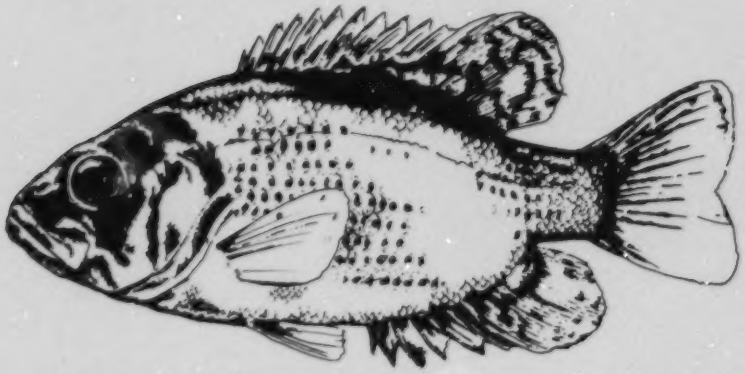
The smallmouth is the dominant predator fish in the cool, clear, permanently flowing streams of the Ozarks. It is identified by its smaller mouth, which almost reaches the rear margin of the eye, and a series of vertical bars on the sides. The young feed on insect larvae; adults feed on fish and crayfish. Smallmouth weigh about 1 1/2 pounds and are about 14 inches long at 5 years of age.



**Spotted Bass**
*Micropterus punctulatus*. Lowland and southeastern Ozark region.

Spotted bass are the most abundant bass in lowland streams and in the main channels of large, warm rivers within the Ozark region. It is easily confused with the largemouth bass, but adults can be distinguished by a mouth which reaches to or slightly beyond the rear margin of the eye, and by spots on the lower side which form prominent rows. The tongue has a rough patch which is easily felt or seen. Largemouth bass usually do not have this rough patch, although smallmouth usually do. Insects and crayfish are the main diet of all sizes of spotted bass. Few spotted bass live longer than 6 years or attain a weight of more than 3 pounds.

## SUNFISH FAMILY
### Rock Bass



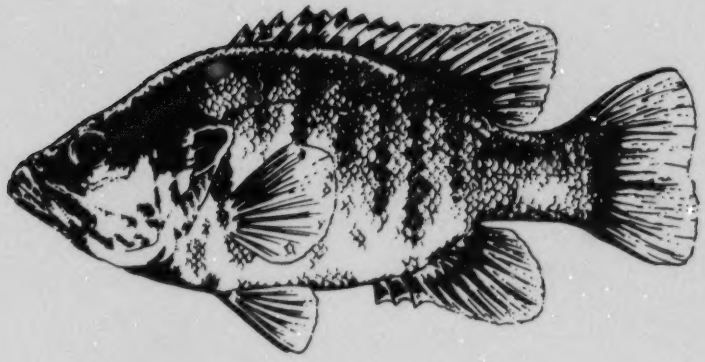
**Rock Bass**
*Ambloplites rupestris*. Ozark region.

Sometimes referred to as a goggle eye because of its large reddish eyes, the rock bass is a heavy-bodied sunfish with a large mouth. It is one of the most widely distributed and characteristic sunfish in clear Ozark streams. Aquatic insects, small minnows, and crayfish make up the bulk of its diet. Adults commonly attain a length of 11 inches and a weight of 1 pound.

## SUNFISH FAMILY
### Sunfishes

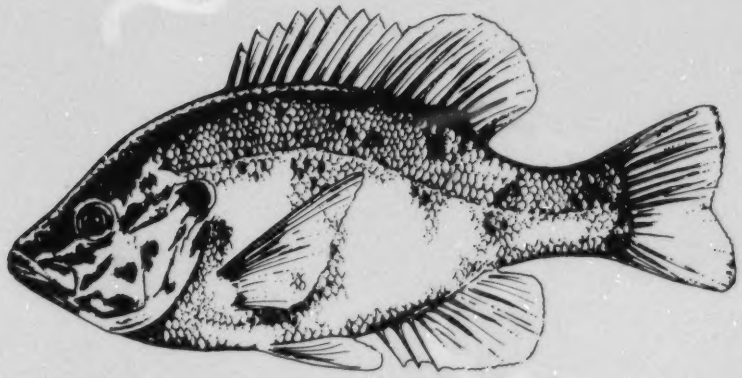
**Bluegill**
*Lepomis macrochirus*. Wide-ranging.

Bluegill are deep-bodied sunfish with a small mouth and a characteristic dark ear flap. The bluegill is the most abundant sunfish in ponds and lakes throughout the state, thriving best in warm, clear water which has abundant aquatic plants. Insects are the staple food item. Growth varies considerably; they commonly reach a length of 6 inches and a weight of 5 ounces.



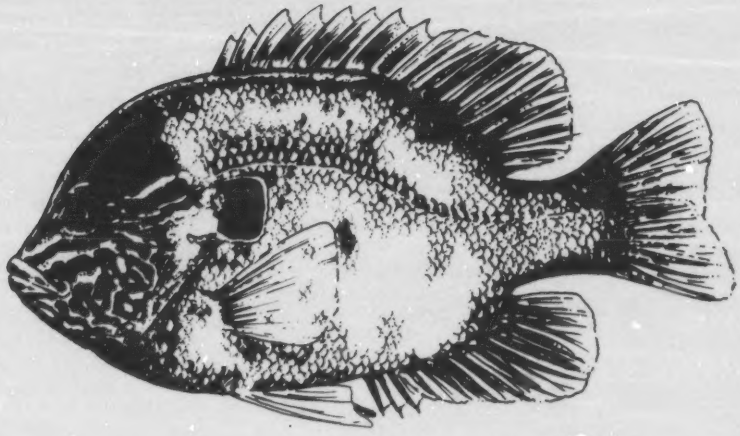
**Green Sunfish**
*Leponis cyanellus.* Sunfish family. Wide-ranging.

A thick-bodied sunfish with a large mouth, the green sunfish is the most widely distributed Missouri fish, occurring in virtually every stream in the state. Insects, small fish, and crayfish are the principal food items. Few exceed a length of 9 inches or a weight of 3/4 pound; occasional individuals may reach 2 pounds.



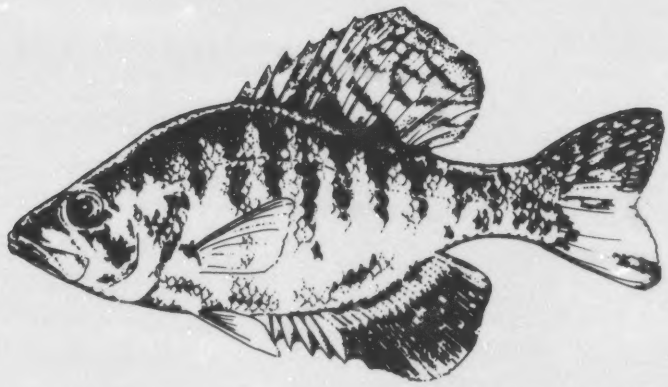
**Redear Sunfish**
*Lepomis microlophus.* Ozark region.

The redear has a rather small mouth and a distinctive ear flap which has a prominent orange or red spot. Although introduced to other locations, their natural occurrence is confined to warm, clear waters of the extreme southern portion of the state. Food consists primarily of snails, earning it the common name of shellcracker. Adults may reach a length of 11 inches and a weight of 1 pound.



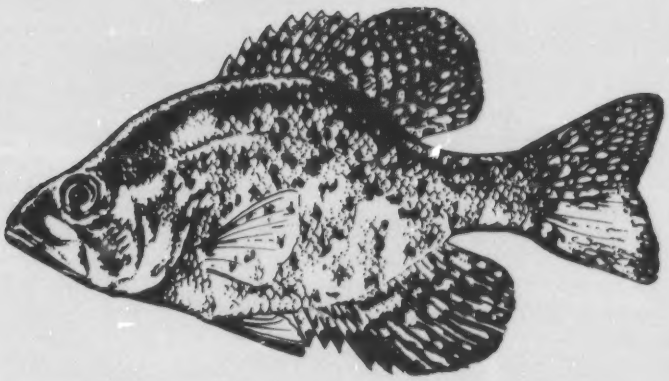
**Longear Sunfish**
*Lepomis megalotis.* Ozark and Lowland regions.

The elongated ear flap is the most distinguishing feature of this sunfish. It is characteristic of clear, permanently flowing streams with sandy or rocky bottoms. It is a relatively small sunfish, reaching a length of 5 inches in 5 years.



**White Crappie**
*Pomoxis annularis.* Wide-ranging.
(Sometimes referred to as Calico bass.)

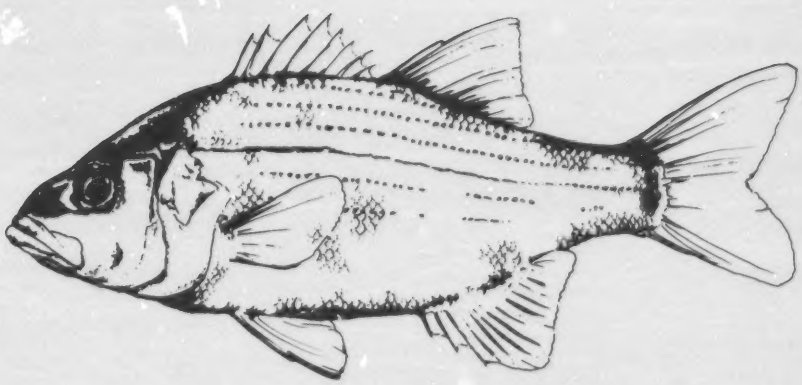
A silvery, deep, and slab-sided sunfish with a large mouth, the white crappie is the more abundant and widespread of the two crappies in Missouri. Crappie feed principally on small fishes, aquatic insects, and microcrustaceans. Small gizzard shad are the staple food for adult crappie in reservoirs. Adults may reach a length of 15 inches and a weight of 2 pounds. Crappie wore the crown as the most popular freshwater sport fish in the United States for many years. It is now considered the second most popular, trailing only behind the largemouth bass.



**Black Crappie**
*Pomoxis nigromaculatus.* Wide-ranging.

Black crappie are very similar in appearance to the white crappie except for the darker markings and dorsal fin with seven or eight spines rather than five or six. Black crappie are less tolerant of muddy water than white crappie and prefer areas of abundant aquatic plants. Growth is about the same as for white crappie, except that at any given size, black crappie are heavier.

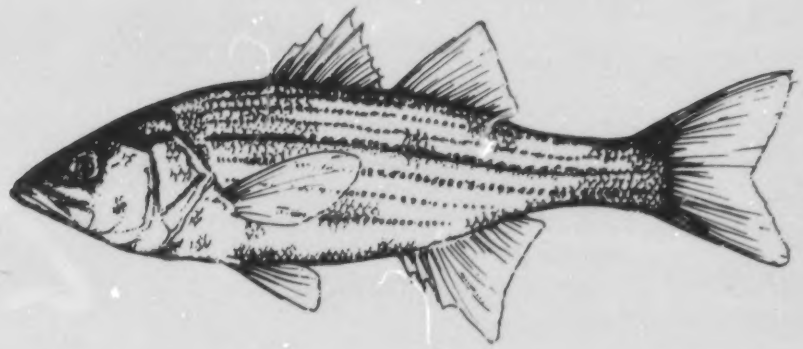
## SEA BASS FAMILY
### White Bass



**White Bass**
*Morone chrysops.* Big-river region.

The white bass is a silvery, spiney-rayed fish with several dark, horizontal streaks along the sides. Formerly abundant only in the Mississippi River and principal tributaries, it now is plentiful in many large reservoirs. White bass are active schooling fish, with adults feeding primarily on forage fish such as the gizzard shad. Their life span is seldom more than 4 years, and few reach lengths of more than 17.5 inches or weights of more than 2 3/4 pounds.

## SEA BASS FAMILY
### Striped Bass



**Striped Bass**
*Morone saxatilis.* Lake Ozark, Truman Reservoir, Osage River.

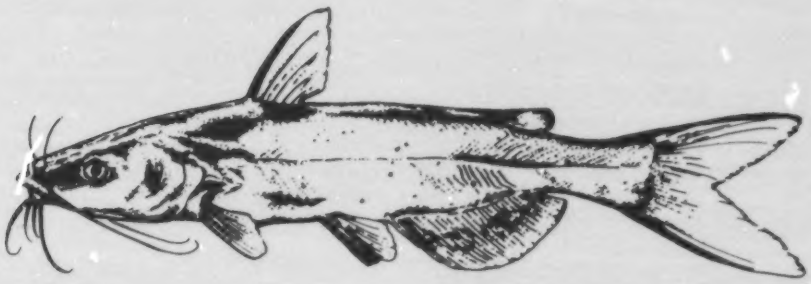
The striped bass is one of the most popular sport fish along the Atlantic and Gulf coasts. It is often referred to as a "striper."

Striped bass were thought to be saltwater fish until about 1950 when it was found they could thrive and reproduce in freshwater. In 1967, the first striped bass were stocked in the Lake of the Ozarks. Striped bass have been stocked here annually since and also have been stocked in other Missouri reservoirs.

The striped bass belongs to the sea bass family and is closely related to our native white bass. It resembles the white bass superficially; both are silvery fish with a series of horizontal stripes on both sides. The striped bass, however, is more slender and streamlined; it is at least three times as long as its body depth. The stripes are definite and continuous and extend onto the tail; whereas, on the white bass, the stripes are fainter, often broken, and fade out in the tail region. Another difference is that striped bass get bigger. The world record for hook and line striped bass is 73 pounds while the world record white bass weighed 5 pounds, 2 ounces.

The striped bass is a voracious, carnivorous fish that is fairly general in its choice of food. In Missouri impoundments, gizzard and threadfin shad make up the bulk of its diet.

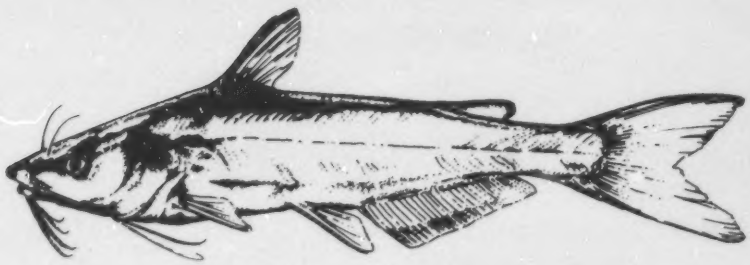
## CATFISH FAMILY
### Channel Catfish



**Channel Catfish**
*Ictalurus punctatus.* (Sometimes referred to as a fiddler because of the fiddling sound it often makes when pulled from the water.)

A slender catfish with a deeply forked tail. Young have spots which disappear with age. The channel cat is the most abundant and widely distributed large catfish in Missouri streams. Its diet includes animal and plant material. Adults are commonly 12 to 32 inches long and weigh from 0.5 to 15 pounds.

**CATFISH FAMILY**
**Blue Catfish**



**Blue Catfish**
*Ictalurus furcatus*. Big-river region.
(Sometimes referred to as white cat.)

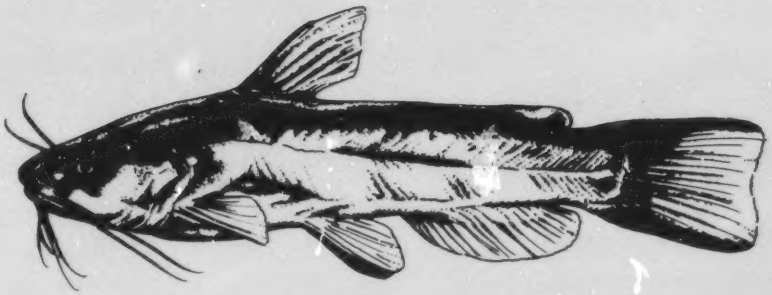
Most often confused with the channel catfish, the blue catfish never has spots, and the outer margin of the anal fin is straight rather than curved. It can be found in the swift channels and pools of the Missouri and Mississippi rivers and their principal tributaries. Their diet is mostly fish and insects. Adults are commonly 20 to 44 inches long and weigh 3 to 40 pounds; some reach 100 pounds or more.

**CATFISH FAMILY**
**Flathead Catfish**

**Flathead Catfish**
*Pylodictis olivaris*. Wide-ranging.

The flathead is a slender catfish with broadly flattened head, projecting lower jaw, and splotchy, light or dark brown color. It is one of the most abundant large catfish in the Missouri and Mississippi rivers and their larger tributaries. Adults eat fish and crayfish and are commonly 15 to 45 inches long and weigh 1 to 45 pounds.

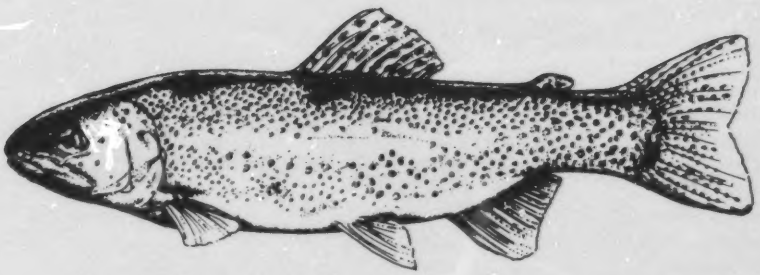
## CATFISH FAMILY
### Black Bullhead



**Black Bullhead**
*Ictalurus melas.* Prairie region.

A chubby catfish with a slight notch in the tail fin, the black bullhead is primarily a bottom feeder on a variety of plant and animal matter. It is most abundant in slow-moving, turbid streams with soft bottoms. Adults seldom exceed lengths of 16 inches and weights of 2 pounds.

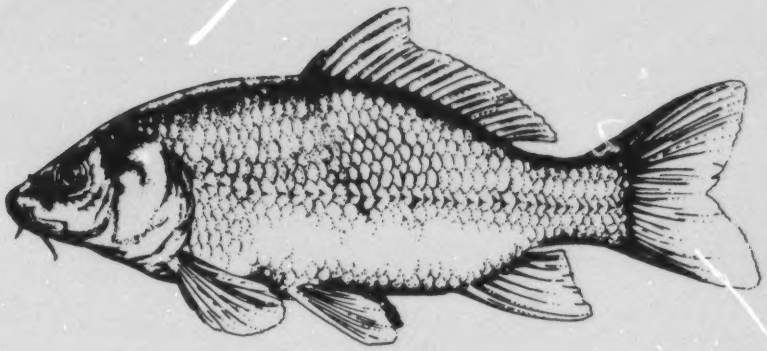
## TROUT FAMILY
### Rainbow Trout



**Rainbow Trout**
*Salmo gairdneri.* Non-native, introduced into spring branches and cool rivers.

First introduced in Missouri in 1882, rainbow trout are restricted to a few areas of the Ozarks. Most are hatchery-grown and stocked, but some naturally reproducing populations exist. They do best in waters which do not get above 70 degrees Fahrenheit. Rainbows feed mostly on terrestrial and aquatic insects. In Lake Taneycomo, where rapid growth conditions are favorable, rainbows grow about 3/4-inch per month. A 15-inch rainbow weighs about 1 1/2 pounds.

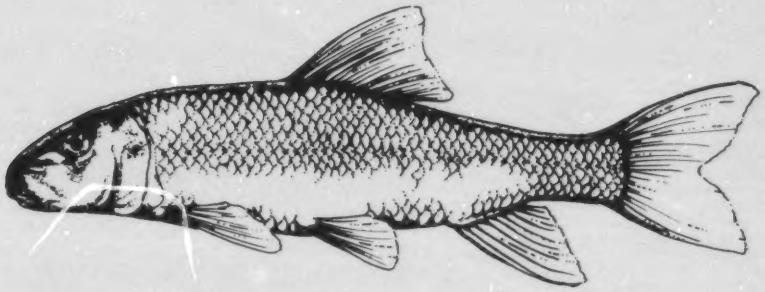
## MINNOW FAMILY
### Carp



**Carp**
*Cyprinus carpio.* Non-native.

Since its introduction into Missouri in 1879, the carp has become one of the most widespread and abundant large fishes in the state. It is found in a wide variety of shallow-water habitats and feeds chiefly on plant and animal material. Adults weigh from 1 to 8 pounds, but can reach up to 50 pounds or more.

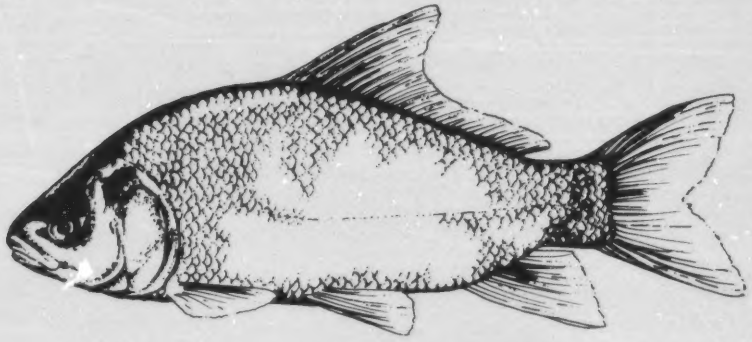
## SUCKER FAMILY
### Golden Redhorse



**Golden Redhorse**
*Moxostoma erythrurum.* Ozark region.

The golden redhorse is most abundant in moderately clear, unpolluted streams having large, permanent pools and rocky or gravelly riffles. Adults occur in large schools, feeding on aquatic insect larvae. They usually do not live beyond 6 or 7 years, and reach a maximum length of about 17 inches and a weight of 2.3 pounds. These fish are most commonly caught by snagging or gigging.

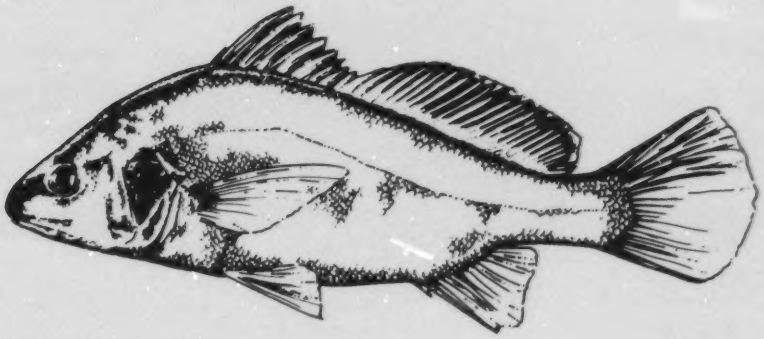
## SUCKER FAMILY
### Bigmouth Buffalo



**Bigmouth Buffalo**
*Ictiobus cyprinellus.* Wide-ranging.

The bigmouth buffalo can be found over much of the state and is primarily an inhabitant of deep pools of large streams, lowland lakes, and large reservoirs. It commonly occurs in schools in mid-water levels or near the bottom. Adults feed mostly on microcrustaceans. It is our largest sucker, commonly reaching a length of 15 to 27 inches and a weight of 2 to 14 pounds.

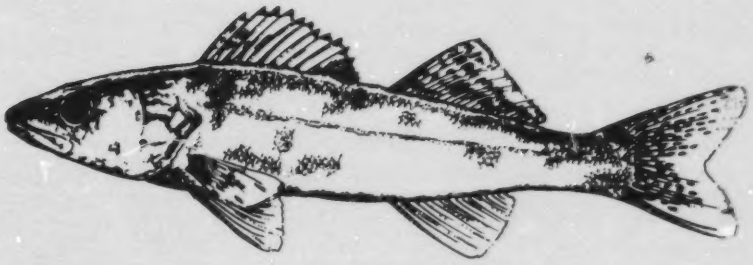
## DRUM FAMILY
### Freshwater Drum



**Freshwater Drum**
*Aplodinotus grunniens.* Big-river region.

Most members of the drum family are marine fish; only a single species is found in Missouri. The name comes from the grunting sounds produced by the air bladder. It is characteristic of large rivers and lakes, where it is a bottom-feeder on insects, crayfish, and mollusks. Adults are commonly 12 to 20 inches long and weigh 1 to 5 pounds.

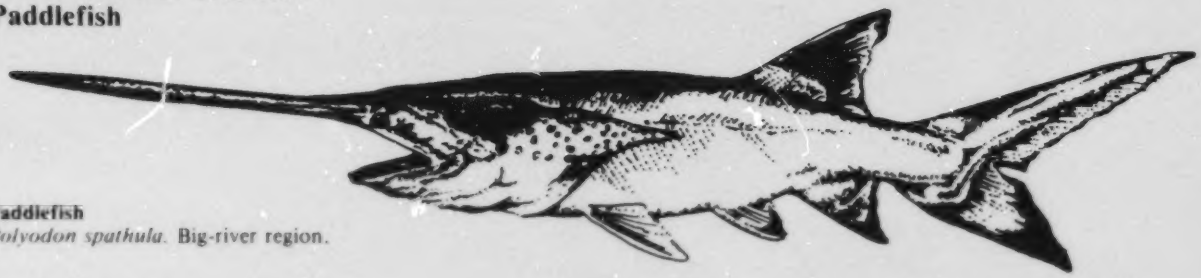
## PERCH FAMILY
### Walleye



**Walleye**
*Sitzostedion vitreum.* Wide-ranging.
(Sometimes referred to as Jack-Salmon.)

The walleye can be found in large streams throughout Missouri. It also has been stocked in many larger impoundments in Missouri. It is a nocturnal fish, feeding in late evening and moving to deep water during the day. Fish are the principal food of adult walleye. Adults are commonly 12 to 28 inches long and weigh from 1/2 pound to 8 pounds; a 20-inch walleye weighs about 3 pounds.

## PADDLEFISH FAMILY
### Paddlefish



**Paddlefish**
*Polyodon spathula*. Big-river region.

The paddlefish family is represented by only two living species. One species occurs in the Mississippi River Valley, the other in the Yangtze Valley in China. The paddlefish is primitive, with a cartilage skeleton rather than bone. It swims about continuously in open water, feeding on microcrustaceans and insect larvae which it filters from the water with its gill rakers. Paddlefish are long-lived; 20-year-olds are common, and some live 30 years or more. They commonly exceed 5 feet in length and weights of 60 pounds. Paddlefish are rarely caught by bait fishing but rather by snagging.

# Bait and Lure Selection

Once you select what species of fish you are going to try to catch, you can then select a bait or lure to use. The type of bait or lure selected will dictate somewhat the type of tackle that will be needed. For example, a fast retrieved lure would not be practical for cane pole fishing.

Natural or live baits can be used to catch all of the common species of fish in Missouri. Artificial lures can be effective on some species, but almost useless on others. Proper bait and lure selection can mean the difference between catching fish and not getting a bite.

By learning the fish's habits and habitat, lure and bait selection will be quite simple. All you are really trying to do is present the fish with a bait that is part of its regular diet or a lure that simulates something in its diet.

## Natural baits

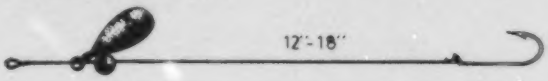
Live or natural baits have always been an important part of a successful fisherman's equipment. Proper use of these baits is just as important as proper selection.

Almost all natural baits are used in a technique called "still fishing." This technique is simply casting the bait to a likely spot and waiting for the fish to bite. There are two main methods of still fishing: one involves fishing the bait on the bottom and the other uses a bobber to suspend the bait. Fishing the bait on the bottom is often referred to as "tight line" fishing; suspending the bait is referred to as "bobber fishing." When fishing live or natural bait, add a sinker or weight to hold the bait down. The weight of the sinker should be just heavy enough to get the bait down and hold it there. Sinkers come in many weights and styles. The most common are "pinch-on" sinkers and "sliding" sinkers. Pinch-on sinkers, such as "split-shot," are often used by themselves when fishing suspended bait. When fishing on the bottom, a pinch-on sinker is used in combination with a sliding sinker.

*Pinch-on sinkers*

To rig a sliding sinker, pass the fishing line through a sliding sinker and attach a hook. Then add a pinch-on sinker 12 to 18 inches above the hook, with the sliding sinker above it. This prevents the sliding sinker from sliding down against the bait, but still allows a biting fish to pull the line out without feeling resistance.

*Sliding sinkers*




When fishing a suspended bait, use a "float" or "bobber." These come in many different styles and shapes, but the key is to select the right size. When fishing for panfish such as bluegill or crappie, use a small bobber. A small fish is unable to pull a large bobber under. It provides too much resistance and the fish will easily rob you of your bait.

*Trolling sinker*

*To keep the bobber from slipping, wrap the line around the clamp.*

Most bobbers either clamp on the line or slide through the line. A bobber that clamps on should be attached so it does not slip during the cast. Depth is important, so once the proper depth is selected you don't want the bobber to slip. A good way to prevent a clamp-on bobber from slipping is to wrap the line around the clamp two or three times.

A sliding bobber has the advantage of making casting easier. A sliding bobber has a "line stop" placed on the line at the desired depth. The line stop must be small enough to pass through the rod guides. The line is passed through the bobber and then a sinker and hook added. When this rig is cast and hits the water, the hook, bait, and sinker drop, pulling line through the bobber. Line continues to pull through the bobber until the line stop hits the bobber and prevents it from dropping further.

There are many varied forms of still fishing. The best rule of thumb is to find one that is most successful for you and stay with it.

**WORMS**

Worms of various types are an age-old natural bait for most types of fish. One point to keep in mind when putting them on a hook is to put them on so they can wiggle. A wiggling worm is irresistible to passing fish.

*It's better to thread a worm onto a hook.*

The most common technique for putting worms on a hook is to loop them on by pushing the hook through them at intervals. This allows them to wiggle, but also makes them easy to steal. A better method is to thread the worm on at intervals: this places the hook through longer sections of the worm's body, making it harder for the fish to steal without getting hooked.

Another point to keep in mind is the number of worms used. A large glob of worms encourages fish with a small mouth, such as bluegill, to peck at the bait. This makes setting the hook difficult. Remember to match the amount of worms used to the type of fish you are pursuing.

Bait-holding hooks, as described in the *Casting Equipment* module, will help hold the worm on the hook.

**CRAYFISH AND SHRIMP**

Crayfish and shrimp are excellent bait for some fish. For the best results, hook them through the soft underside of their tail. If you use them for still fishing, remember to remove the pinchers to prevent them from crawling up the fishing line.

*Remove the pinchers from crayfish.*

**MINNOWS AND BAITFISH**

Minnows are another commonly used live bait. Several methods are used for hooking them. The key is to hook them without damaging their vital organs; this will allow them to live longer on the hook and stay active. A lively minnow is much more appetizing to most fish than a dead one.

*Hook minnows so they stay alive.*

Keeping minnows alive in a container can be a problem on hot summer days. Sudden drops in water temperature will

kill minnows quickly. An occasional ice cube dropped in your minnow container will help maintain a steady temperature. Foam coolers or buckets make excellent minnow containers. The lid should be kept on whenever possible to prevent a temperature drop.

*Hook grasshoppers through their collars.*

**GRASSHOPPERS AND CRICKETS**

Grasshoppers and crickets are good summer bait for many types of fish. A good method is to fish them without a sinker or bobber. Their action on top of the water will attract the attention of fish from long distances. The best way to hook them is through the collar around their neck; this will allow them to remain active.

*Hook frogs and lizards through the lips.*

**FROGS AND LIZARDS**

Frogs and lizards make good bait for many fish. They can be fished on the bottom, on the surface, or suspended. The most common way to hook frogs and lizards is through the lips; this allows them to remain active.

It is important to identify the types of frogs and lizards that are legal to use as bait. Some species are protected.

**Prepared baits**

There are hundreds of home recipes for prepared baits as well as many that are commercially made. These are commonly used for carp and channel catfish.

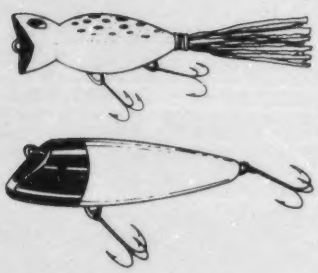
There are two main methods for fishing prepared baits. The baits that are thick in consistency are shaped around a treble hook, covering it completely. The thin consistency baits are fished on a piece of wet sponge. The sponge serves to soak up the bait and hold it on the hook. Almost all prepared baits work best when fished directly on the bottom.

*Prepared bait*

**Artificial lures**

Artificial lures come in all sizes, shapes, and colors; some float, some sink, some dive, some vibrate, some rattle, and some pop, but they all have one common bond. All artificial lures are designed to resemble minnows, baitfish, crayfish, frogs, snakes, worms, mice, birds or other assorted fish food. Some of these lures have a built-in natural action when retrieved; others must be provided action by the fisherman.

A good rule of thumb is to select a few lures for the species of fish you plan to fish for and then perfect your use of those lures. Artificial lures can be grouped into general categories.



*Topwater lures*

**TOPWATER OR SURFACE LURES**

Topwater lures are built to crawl, wiggle, gurgle, sputter, pop, or just lie still on the surface. Some topwater lures have a built-in action. These usually have lips, arms, or propellers which create action as the lure is retrieved. Some lures such as poppers, darters, frog imitations, and jump baits get their action from the fisherman.

When fishing topwater lures, allow the lure to hit the water softly and lie motionless for about 15 seconds. This is

because the lure may temporarily spook a fish, but after a few seconds, the fish's curiosity will take over. After 15 seconds, softly twitch the plug and begin the retrieve called for with the lure. Lures with a built-in action usually have one speed at which they perform best. Other lures may be twitched or jerked erratically. Popping type lures are "chugged"; in other words, the plug is retrieved by periodic jerks on the rod tip.

*Floating-diving lures*

**FLOATING-DIVING LURES**

Floating-diving lures are made to float on the surface until retrieved. When retrieved, a metal or plastic lip causes them to dive. The longer the lip, the deeper the lure will dive. Most have a built-in minnow or baitfish action. They wiggle through the water as they are retrieved. Some are even jointed in the middle to make them wiggle more and some are hollow with a ball inside which rattles.

Float-diving lures are retrieved at various speeds. Most fishermen experiment with different speeds until they find one that works best for them. Sometimes an erratic fast-slow retrieve works best. The floating-diving lure is commonly used by fishermen that troll.

**DEEP-RUNNING LURES**

Deep-running lures are weighted so that they can't float. They have large lips so they will swim deep, many times where fish are found during hot summer weather. These lures work best in deep, snag-free waters. The large lip allows them to hit and bounce over most rocks and logs, but they readily hang up in brush.

*Deep-running lure*

Deep-running lures imitate baitfish and crayfish. Usually, the faster the retrieve, the deeper they dive. Some lures, however, cannot be retrieved too fast or they will simply spin. Most fishermen experiment with different retrieves and find one that works best in different situations.

Some deep-running lures have no lips at all, but instead have a heavy body, usually lead. These lures sink at about one foot per second. This allows the fisherman to "count down" the lure and know the depth he is fishing. Deep-running lures are popular with fishermen that troll.

**SPOONS**

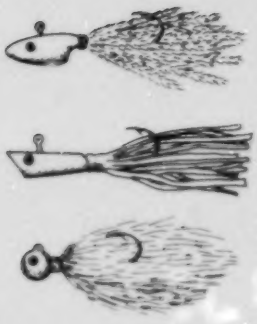
Most fishing spoons have a slender shape and come in a variety of sizes, colors, and finishes. The most common come with a shiny metallic silver finish.

*Spoons*

The typical fishing spoon is one in which a long tapered piece of metal shaped like a spoon is attached to a treble hook with a split ring. Some have a single hook welded to the spoon which rides on top of it, making the spoon almost weedless.

Spoons are often "dressed-up" by adding a rubber skirt or tail, or a pork rind trailer.

To remove the metallic flash on bright sunny days, take along magic markers of various colors and simply color the spoon with the color you choose. The magic markers, of course, must not be water soluble.



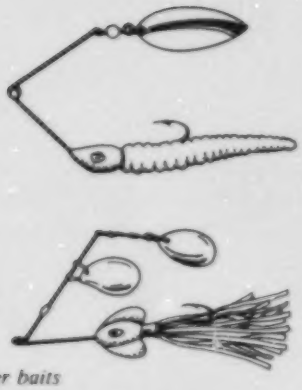
*Jigs*

## JIGS

Jigs are typically single hook lures in which a lead body is molded on a special jig hook. A tail is added by tying on feathers, fur, or a rubber tail and body. The lead head is painted either the same color as the tail or a different color.

Since jigs have no built-in action, they must be worked by the fisherman using the rod and by the speed of retrieval. Jigs are worked up and down in a short rapid action called "jigging." This action imitates an injured minnow.

In addition to simple skirts tied on the hook shank, bodies of chenille and hackle are sometimes added to make them more lifelike. Rubber jig tails usually have a body built on them. These are simply threaded on the hooks. Jigs range in size from 1/64 ounce to more than 1 ounce. When a large rubber skirt or tail or piece of pork rind is added to a larger jig, it is often referred to as the "jig and eel."



*Spinner baits*

## SPINNER BAITS

A spinner bait is simply a jig with one or more spinners added to it.

The spinner portion of these lures is attached to a safety-pin-shaped arm molded in front of the jig head. The line is tied to the eye at the bend of the safety pin arm and not to the jig head itself. Extending from arm or arms are spinner blades. In some lures the spinner blades revolve around the wire arm; in others, the spinner blades are fastened to the arm by a swivel.

Some spinner baits have only one spinner blade while others have two or three. Those with more than one spinner blade may have them in line or with a single wire arm that lies over the top of the jig body and hook, or may have the spinner blades attached at the end of each of two arms extending from the eye.

The jig bodies of spinner baits often have rubber, plastic, or fur skirts. Many fishermen add to this a rubber or pork rind tail. Besides overall appearance, the rubber or pork rind tails serve to make the lure sink more slowly.

Spinner tails range in size from 1/8 ounce to more than 1 ounce. The smaller ones are primarily fished for panfish, while the larger ones are fished for largemouth bass.

Some spinner baits are fished with a steady or erratic retrieve and are fished with a jigging action. Others are designed to run along the surface making a "plop-plop" sound as the blades slap the water.

Spinner baits have proven to be good reliable "fish-getters."

*Spinner*

## SPINNERS

Spinners are lures in which a blade is attached to a central shaft by a U-shaped device which allows the blade to spin around the shaft. Behind the blade, beads of all shapes and sizes are usually added. Behind the beads is a body made of metal, plastic, or rubber. An eye formed in the

*Spinner*

upper end of the shaft serves as a place to tie the line. Sometimes skirts of rubber, fur, or feathers are added to provide a more attractive look.

Spinners range in size from tiny 1-inch long, 1/16-ounce lures to large, long, heavy lures that may weigh more than 1 ounce. Small spinners have been a favorite panfishing lure for years, especially along Missouri's many miles of float streams.

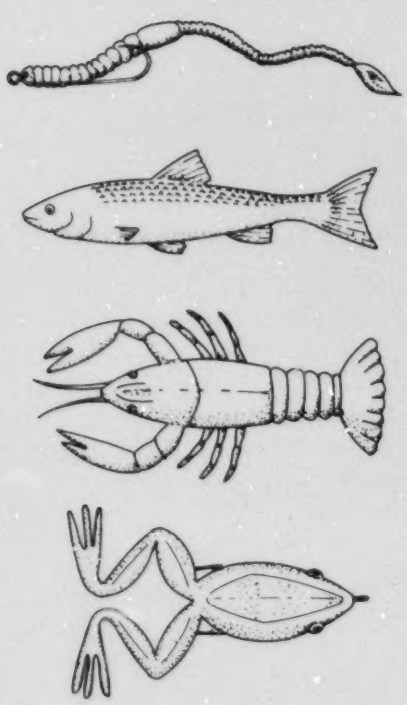
## SOFT PLASTIC LURES

In the 1940s when the soft plastic lures were first used, a revolution occurred in fishing. These lures seem to grow more popular each year and continually prove to be good "fish-getters."

Plastic worms seem to be the most successful and the most popular of the soft plastic lures, but rubber frogs, lizards, crayfish, and minnows also are popular.

Soft plastic baits come in all sizes and colors. Some are inflated with air which makes them more buoyant, others come in different flavors and scents. Their realistic appearance and feel is their key to success. Many soft plastic lures are fished with only a weight, but some are fished in combination with other lures. Since most plastic lures come unrigged, you can rig them to suit your fancy or a particular situation.

Since soft plastic lures are made to appear real, they should be fished to duplicate the actions of the animal they are portraying. Just remember, a worm doesn't crawl very fast. Patience is the key to successfully fishing soft plastic lures.



*Soft plastic lures*

## CARE OF ARTIFICIAL LURES

Artificial lures, like most good things, can prove fairly expensive over a period of time. With care, however, they can last a long time.

All hooks should be kept sharp and rust free. Use a fingernail file to sharpen hooks.

Soft plastic baits contain plasticizers to keep them soft. It is a good idea to store them separately in plastic bags.

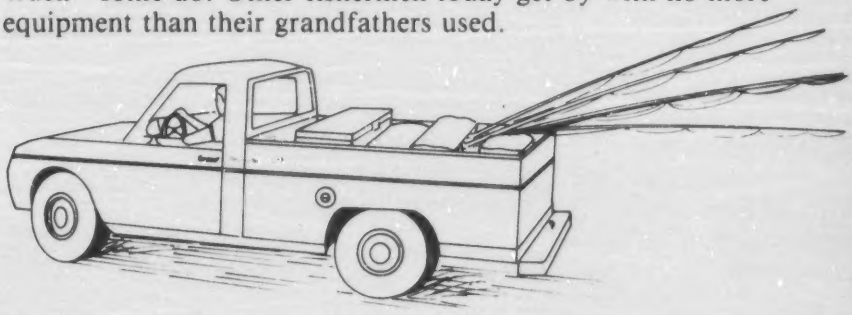
A little paint can go a long way in restoring faded lures. With lures ranging in price from $1.50 to $4, restoration can save a lot of money.

Another good way to save lures when fishing from a boat is a "plug-knocker" or "plug-retriever." These are weighted objects with little sections of chain dangling from them. They are tied to a heavy cord and slipped on your tight fishing line. They slide down the line to the snagged lure. By raising and dropping them, they will either knock the lure loose or catch the hooks in the chain. The lure can then be pulled free. You can buy a lure retriever or make one using old spark plugs.

*A plug-retriever helps save lures.*

**Fishing tackle and accessories**

Fishing equipment is a billion dollar industry. There are literally thousands of different pieces of fishing equipment available today. Some are designed to make fishing easier, some to make the fisherman more comfortable, and most are advertised to increase anyone's success. A modern-day fisherman can accumulate enough fishing equipment to fill a truck—some do. Other fishermen today get by with no more equipment than their grandfathers used.



The real question is: Does a lot of fishing equipment mean you will catch a lot of fish? The answer, of course, is no. The key to catching fish is you, not your equipment. You must learn how to select only the equipment that will serve your needs best. Experiment with new equipment, but don't think you have to rush out and buy every new item that comes along. Don't buy cheap imitations of good equipment, rather buy quality equipment that will last and serve you over many fishing trips.

The best way to start is to buy just the basic items you will need to get started; then gradually experiment and add to your equipment as needed.

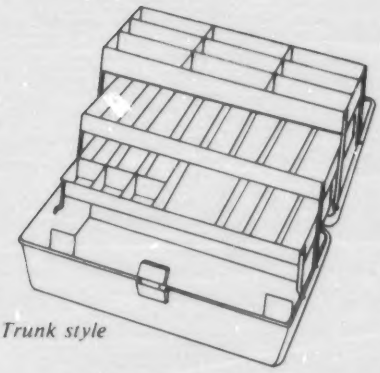
The *Casting Equipment* module covers how to select the rod, reel, line, and hooks that will serve you best. In addition to these, there are other necessary pieces of basic fundamental fishing tackle.

Some of the pieces of fishing tackle needed will depend on the kinds of fish you want to catch. Some items, however, are basic to almost all types of fishing. Most fishermen will fish for almost all of Missouri's species of fish at some time or another. Some, however, specialize in only one species; for example, trout or largemouth bass. These fishermen add items to their basic tackle that are designed specifically for the species they are most interested in.

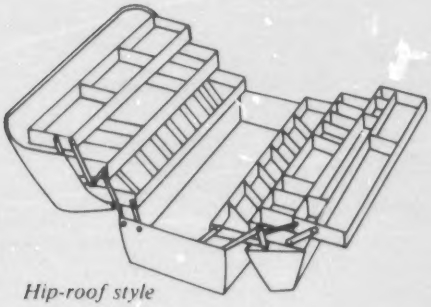
**TACKLE BOXES**

Tackle boxes are available in all shapes and sizes and are made of plastic or metal. The purpose of any tackle box is to make storage and transporting of other tackle items more convenient.

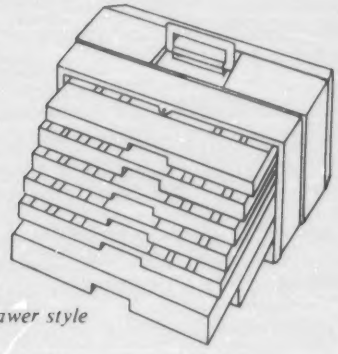
Everything from Prince Albert Tobacco cans to lunch pails have served as tackle boxes. Any container that will hold your fishing accessories and is easy to carry will work. However, a tackle box with several separate compartments has the advantage of keeping items from tangling together and makes finding hooks, pliers, plugs, and other accessories easier.



*Trunk style*



*Hip-roof style*



*Drawer style*

When trying to select a tackle box, it is a good idea first to assemble all the tackle items you plan to carry with you on fishing trips. This will give you an idea of how large a tackle box you need and which design might serve you best. Later on, if you fish more and more, you may find it necessary to have more than one tackle box. Many fishermen have a separate tackle box for trout and panfish, bass, and catfish. But when you are getting started, one good tackle box should serve most all your needs.

Metal tackle boxes have the advantage of being stronger than plastic ones, but they tend to be heavier and are susceptible to rust. Plastic tackle boxes are tough, lightweight, and won't rust.

Tackle boxes come in three basic designs. The first and most common is the *trunk* style tackle box. This style has a top that pivots back to expose a divided tray or series of trays with a large compartment underneath. The *hip-roof* style tackle box has a divided top that pivots back from side-to-side exposing a series of divided trays on both sides. It also has a large compartment beneath the trays. The *drawer* style tackle box has divided trays that pull out from the side like a drawer. The bottom drawer is usually deeper for holding larger items.

Many special designs of tackle boxes are available today. Some are made to wear on a belt or fit in a pocket. Some are made especially for certain types of artificial lures such as plastic worms or spinner baits. The tackle box you purchase should be based on your individual needs. Remember—by first assembling your basic items, you can select the style of tackle box that will best serve your needs.

## LANDING NETS AND GAFFS

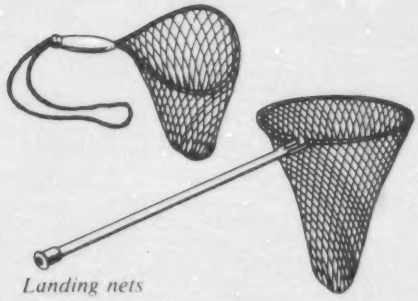
Landing nets or gaffs can make landing fish much easier: they can help prevent the big one from getting away right at the side of the boat or edge of the bank.

Gaffs are large metal hooks with a wood or plastic handle. They are used to land fish by slipping through a fish's gills or by driving the point through the fish's body. The big disadvantage to gaffs is that any fish landed by one is usually injured and can't be released. Gaffs are more commonly used in salt-water fishing.

Landing nets come in several sizes and shapes. You should select your landing net based on the kind of fishing you plan to do; for example, a landing net with a 3-foot opening and 4-foot handle would not be appropriate if you plan to use it on trout.

Most landing nets have openings from 1 foot to 3 feet; handle length usually varies from 1 foot to 4 feet. A long-handled net is handy when fishing from a boat, off a dock, or from the bank. A short-handled net is good to use when wading.

Some long-handled nets have a collapsible handle which makes storing them easier. The net mesh itself is usually made of cotton, nylon, or rubber.

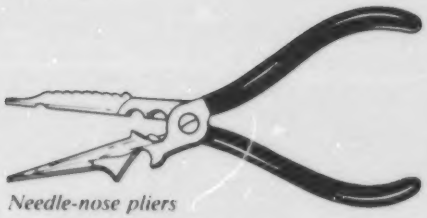


*Landing nets*

*Gaff*

A cotton net should be dried before storing or it will rot. The nylon net solves this problem. The disadvantage of nylon, however, is that hooks tend to tangle in them while landing fish. An alternative is a rubber mesh net which doesn't tend to rot and is practically tangle free.

Landing nets are oftentimes dropped or kicked into the water so it's a good idea to get a landing net that will float.

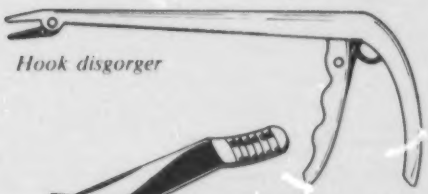


*Needle-nose pliers*

## HAND TOOLS

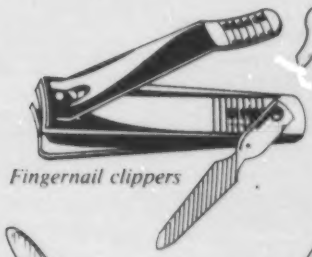
While many hand tools are available, certain tools are considered necessities.

A good pair of needle-nose pliers can serve several purposes. They work well as hook removers when a hook is embedded in a fish's throat and also in closing lead sinkers, such as the split-shot type. Select a pair that includes a wire cutting section. This allows you to cut the point and barb off a hook if it becomes embedded in a fisherman instead of a fish.



*Hook disgorger*

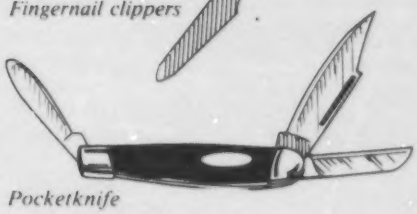
A long, slender hook disgorger is handy for removing hooks embedded in fish. It is usually longer than a pair of needle-nose pliers and will reach further down a fish's throat.



*Fingernail clippers*

A pair of fingernail clippers is handy for cutting monofilament fishing line. Most have a nail file on them that can be used for sharpening hooks.

A small pocketknife in your tackle box is good for cutting bait and whittling when the fishing is slow.



*Pocketknife*

A small bottle of reel oil and a screwdriver are handy to have in case a reel malfunctions and needs adjusting.

A bar of hand soap and a soap dish are always good items to have in your tackle box. Soap allows you to wash outboard motor oil or gas off your hands before handling bait. Sandwiches also tend to taste better with the worm and fish slime removed from your hands before eating.

A plug-knocker or plug-retriever that was mentioned earlier can save several dollars in lost lures.

These are some of the basic hand tools for a fisherman. With experience, you will learn what other tools you may want to carry with you.

*Reel oil and screwdriver*

## FISH CLEANING TOOLS

Most persistent fishermen will eventually bring home a stringer of fish. To clean them and get them ready for the skillet, a few basic tools are needed.

There are two types of fish cleaning knives: fillet knives and skinning knives.

Fillet knives are used for filleting fish. They have long, thin, flexible blades that bend to follow the contours of fish.

*Fillet knife*

A skinning knife is any knife that has a sharp, strong blade. It is used for removing head, tail, fins, and entrails.

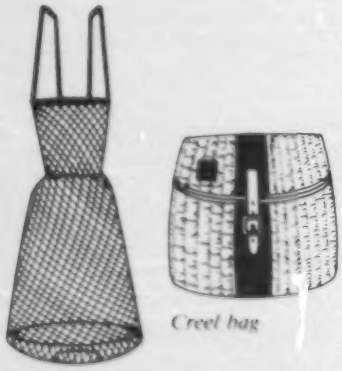
A good whetstone or sharpening steel will help keep your knives sharp. When cleaning fish, a dull knife can be more dangerous than a sharp one.

*Scaler*

*Skinning board*

*Rope stringer*

*Chain stringer*



*Wire mesh bag*

*Creel bag*

A scaler is a tool used for removing a fish's scales. It is inexpensive and makes scale removal easier.

If you plan to skin your fish, especially catfish, be sure to have a pair of fish skinning pliers. They have a specially designed jaw for gripping the slippery skin.

Skinning boards are not really necessary, but they can make the job of cleaning fish much easier because they hold the fish by the tail while you clean it. Fish are slippery and hard to hold, which makes knife work somewhat dangerous. A skinning board solves this problem. Some people buy specially designed gloves for holding the fish while cleaning. A little salt on your hands also will help.

**STRINGERS AND BAGS**

Pointed willow branches made good fish stringers for hundreds of years, but modern man has improved upon this method.

Rope stringers have been popular for years and are still popular today. Original ones, made of cotton rope, have been replaced by nylon and plastic. A rope stringer consists of a cord about 4 feet long with a metal ring on one end and a tapered metal point on the other. When stringing the first fish, the point is passed through the fish's gills and then through the metal ring. This clinches the stringer to the fish. Other fish are slid down against the first fish by passing the metal point through their gills. These stringers are very inexpensive. Fish don't remain alive very long on this type stringer, however, which makes them impractical for an all-day fishing trip.

The chain or clip type of stringer has separate safety-pin-type clips. Each stringer usually has 8 to 12 separate clips. Fish are secured by running a clip through the fish's gill or lip. Passing the clip through a fish's gill is more secure, but the fish will die more quickly. If fish are to remain on a stringer for several hours, it is better to pass the clip through the fish's lip instead of the gill. The clip-type stringers are made from metal, plastic, or nylon. Metal stringers are strong but tend to rust over a period of time and are noisy when used from a boat. Nylon or plastic stringers are strong, lightweight, quiet, and won't rust.

Another popular method of securing fish today is a wire mesh bag. These have a spring-type, one-way door on top. Fish are dropped into them and the bag is secured to the boat or bank and lowered into the water. They speed up the stringing process and keep fish alive very well. Some have a flotation ring so the top part is held above water. Wire mesh bags are a big improvement over the gunnysack of bygone days.

A special method of securing fish is still used by some trout fishermen. This method uses a *creel* made from wicker or canvas. The creel is a basket or satchel worn with a shoulder strap. Fish are dropped in these and the creel is occasionally dipped in the water. Evaporation keeps the fish fresh but not alive.

Some modern fishing boats have a live well built into them, usually under a seat. This well is a recessed area which holds water and uses an aerator much like an aquarium.

Again, selecting a method of stringing or securing fish will be a personal preference based on individual needs. Keep in mind that fish spoil rapidly after they die, so keeping them alive is a major concern when fishing.

## Fishing Skills Other Than Casting

### Locating fish

**BASIC NEEDS OF FISH**

It has been said many times that the secret to finding fish is understanding their needs. The needs of fish fall into three basic groups: *food, oxygen,* and *shelter.* If any of these three are missing, fish won't be present.

As with any living organism, fish need food to survive. They will seek out food if none is close at hand. In many cases, fish will move out of their daytime shelter during the early morning and late evening hours to feed. This is why these times have always been popular for fishing.

Knowing what food a particular species of fish feeds on will help you select the correct bait or artificial lure to use. A body of water that supplies a plentiful food supply may make fish harder to catch, but the fish caught will tend to be larger and healthier.

Just as we require oxygen, so do fish; some species require more to survive than others. Some types of water contain more oxygen than others; for example, a clear-running stream will tend to have more oxygen than a shallow, muddy pond. A slow-moving, muddy stream probably won't contain enough oxygen or good habitat for smallmouth bass, but may well contain enough for catfish. In most bodies of water, the oxygen levels will fluctuate on a daily basis, so fish tend to move around to locate the minimal oxygen level they need.

Most people think a fish's shelter is water. This is only partially true. Water of course is necessary, but so is shelter. Shelter for the fish may be weed beds, boat docks, submerged trees, rock outcrops, or just deep water. Shelter provides shade from the bright sun, a place to hide from larger predator fish, and a place for predator fish to ambush smaller fish.

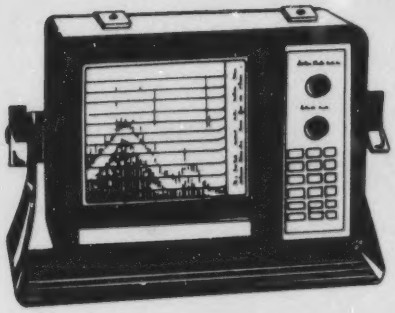
Much research has been devoted to the basic needs of fish. Discussed here have been only general considerations. There are many more factors such as water temperature, the pH level of the water, migration, spawning, and others that will be discussed in more detail in the module on advanced sport fishing.

## READING WATER

When trying to locate fish, reading the water is an important skill. Reading water is the ability to look over a body of water and select likely looking spots to fish. This skill is acquired by learning the three basic needs of fish by experimenting.

It has been said that 90 percent of the fish in a body of water can be found in 10 percent of the water. The ability to read water allows you to save time and effort by eliminating the 90 percent that contains no fish and concentrating on the 10 percent that does. Reading water is the key to locating fish.

## STRUCTURE FISHING



*Depth finder*

Expert fishermen have always understood structure fishing. By studying a body of water and the structure above the water, you can usually get a good idea as to what the underwater habitat is like. Modern depth finders and fish locators can take out all the guesswork, but these are fairly expensive and somewhat restricted to boat fishing on larger bodies of water. Beginning fishermen need not be concerned with these. They will be covered in the *Advanced Sport Fishing* module.

Again, structure fishing involves locating fish. Largemouth bass don't like bright light. So on a bright, sunny day, the shallow or open water can be eliminated. You would concentrate on areas that provide shade for the bass, such as trees, boat docks, or rocks. It has been said that you can find structure without fish, but you can't find fish without structure.

**Pattern fishing**

Pattern fishing involves trying to get fish to bite. When trying to get fish to bite, a basic understanding of their senses will help. Fish have the same five senses we do—sight, touch, smell, taste, and sound. Fish use as many of these senses as possible when feeding.

## SIGHT

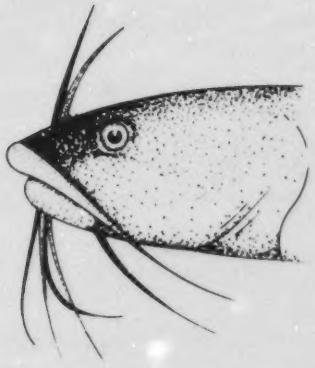
*Fish use sight more in clear water.*

When possible, fish use their sight to locate food. In clear water, sight is more important than in muddy or turbid water. When fishing clear water, you want your bait or lure to be seen so it must look natural. Fish are not color blind. Scientists have proven fish can even distinguish shades of color. This is why natural colored lures are popular in clear water fishing. Colors are a result of light refraction and since the deeper you go the less light there is, natural colors aren't as important in deep water fishing as in shallow water fishing. Highly reflective colors such as blue, green, or chartreuse are popular colors in deep diving lures.

## TOUCH

Fish can feel the food once it's in their mouth. If the bait feels unnatural, they will spit it out before you can set the hook. A hard plastic lure that imitates a bait fish doesn't feel natural, so unless the fish is hooked quickly it will

probably get away. This is why the soft plastic lures are a favorite among bass fishermen.



*Barbels contain olfactory and taste bud nerves.*

**SMELL AND TASTE**

Fish have a good sense of smell and taste. Smell coincides with taste, so if a bait smells good, the fish assumes it will taste good. Outboard motor oil, gasoline, or insect repellent on your hands is a surefire way to *not* catch fish.

In muddy or dark water, fish rely heavily on their senses of smell and taste in locating food. Channel catfish and carp, for example, are often found feeding in low light water. They rely on smell and taste to feed. The barbels or "whiskers" on the fish contain olfactory and taste bud nerves which allow them to smell and taste their food before even taking it in their mouths. Some fishermen spray commercial fish attracting scents on their lures before fishing.

**SOUND**

Fish have a much keener sense of hearing than we do. It has been proven that a bass actually can "hear," by feeling vibrations, a crawdad walking along a rock. Some fish rely heavily on their sense of hearing to feed. Bass, feeding at night, can't see much but they can hear. This is why noisy surface lures are popular with night fishermen.

*Think quiet when fishing.*

Unnatural noises can spook a fish. Walking noisily along a stream bank can spook a fish a long way up and down the bank. When fishing from a boat, a good way to *not* catch fish is to shut your motor off right over the water you plan to fish, throw the anchor, bang open a tackle box, drop a can of pop, and cast your lure so it splashes two gallons of water into the air. Think *quiet* when fishing.

Knowing the senses of fish and how they use them to feed can help you select your lure or bait and the method you should use to present it.

On one day's fishing you might locate a crappie bed in 20 feet of water. You tie on a pink and white 1/8-ounce jig and soon have several nice crappie. Two weeks later you return to the same exact spot and fish for an hour with the same pink and white 1/8-ounce jig and don't get a bite. So you tie on a 1/8-ounce yellow jig and still no bite. Now you try a 1/16-ounce yellow jig and soon have several nice crappie. Why would this happen? Probably two weeks ago the crappie were feeding on minnows that most resembled the 1/8-ounce pink and white jig. Two weeks later the 1/16-ounce yellow jig most resembled the minnows they were feeding on. This is when a fishing log or diary is handy. By keeping records on fish caught, locating depth, temperature, bait or lure, time of day, time of year, and weather, you will have a written record to refer to when fishing gets tough. You are allowing knowledge gained from past experience to help improve your success.

*You can improve your fishing by keeping a record.*

**Trolling**

Trolling, another fairly common way to fish, requires a boat and motor. To troll, select a lure and cast it behind the boat. Then run the boat and motor, slowly crisscrossing over a body of water until a fish strikes your lure. You can stop and fish that spot for awhile or continue to troll. This method is somewhat restricted to using artificial lures and fishing for game fish.

**Setting the hook**

The ability to know when and how to set a hook is an important skill in successful fishing. Knowing *when* to set the hook will come with experience. Knowing *how* to set the hook can be practiced.

Setting the hook calls for a sharp backward movement of the rod. The rod should first be pointed in the direction of the strike, with no slack line. Sharply pull the rod up and to the rear. Fish have tough mouths so it takes a good sharp action to set the hook. Sharp hooks will help insure that the hook gets set. You can also set the hook too hard, which can break your line or straighten the hook. Set the hook sharply but don't try to jerk the fish clear out of the water. A light action or limber rod will require more force to set the hook.

Getting fish to strike should be your first goal, but unless you can properly set the hook, your strike will be to no avail.

**Playing a fish**

Playing a fish after the hook is set is what sport fishing is all about.

The first rule is to have your reel drag set properly in relation to the weight of line you are using. The drag will prevent a sudden strong surge by the fish from breaking your line.

After the hook is set, hold the rod high and keep all slack out of the line. By holding the rod high and keeping pressure on the fish, you are actually keeping its head up; this is important to keep the fish from getting tangled in rocks, lily pads, brush, or other structure. It is important to know the obstacles or structure in the area you are fishing so you can play the fish around them.

Most predator fish occasionally will leap from the water while being played. This is an instinct they use to dislodge small fish that become caught in their throats. Unless a small fish is swallowed head first, it can fan out its dorsal and anal fins, causing it to become lodged in the predator fish's throat. When this happens, the predator fish will leap into the air and toss its head from side to side in an attempt to dislodge the small fish. When hooked, the fish assumes the hook is a fin or spine from a smaller fish that has become lodged; so it leaps into the air in an attempt to free it.

While playing a fish, you should lean toward it to avoid breaking the line, but you must be careful to keep all slack out of the line. A key point to remember is that the *less* line you have out, the *more* control you have over the fish—another advantage of short, accurate casts over long

distance casts.

Above all, *you* play the fish; don't let the fish play you.

**Landing a fish**

Many fish are lost as the fisherman tries to land them. It is disheartening after playing a nice fish to lose it at the last minute. The best way to prevent this from happening is to plan ahead and use the best method for the situation.

Two key points to consider when planning your landing method are the species of fish you are pursuing and the environment in which you are fishing.

When fishing from a high bank or a boat that sits high in the water, a landing net or gaff hook is almost a must. If the species of fish you are pursuing has teeth or sharp spines, a landing net or gaff hook is again the best method of landing the fish.

Fish that have a large mouth and no teeth such as bass, crappie, or green sunfish can be landed by grasping them by the lower jaw. This partially paralyzes them and makes removing the hook easier.

Whatever method you choose, be careful of a last minute surge by the fish: seeing your hand or net may spook it. Because of this last minute surge, always net a fish from the head end. This way, if it lunges forward it won't be able to get out of the net.

Never land a fish by raising it into the boat with the rod. This is an excellent way to lose the fish and damage your rod.

**Releasing fish**

Someone once said, "The only person who needs to worry about releasing fish is one who likes hamburger better than fish." This is not always the case, however.

More than 60 million Americans fish each year and many do so more for the sport than for the food. Many people enjoy catching and releasing fish and seldom or never keep what they catch. This is fine as long as the fish are released properly. Improperly released fish stand little chance of survival, so releasing them is a waste.

The best way to release a fish is to do so without removing it from the water. Release it as quickly as possible, with as little handling as possible. Fish are covered with a slime that protects them from disease and parasites. When you handle them, this slime will come off on your hands, thus leaving them unprotected until they can secrete more. If you must handle a fish, always be sure to wet your hands first, thus keeping the slime removal to a minimum.

Playing a fish is a lot of fun, but if you plan to release it don't overdo it. You can exhaust a fish to the point that it won't be able to recover. This is particularly true if you are releasing fish back into a swift current.

If you plan to release a fish, *never* pick it up by the gills. This can damage the gills and can cut your hand as gill plates on some fish are quite sharp.

When you release a fish, do so quickly. Don't let the

fish flop around in the boat or on the bank. Always slide the fish into the water, never throw it back.

If for some reason you need to secure fish for awhile and may release them later, use a live well or a fish basket. If you use a stringer, never run it through the gill plates. Rather, run the clip through the fish's lip, just behind the bone. Make sure the fish can still breathe and its mouth can still close. A fish's gills can't operate properly unless it can close its mouth.

Releasing fish properly is an important step in fish management. A properly released fish can survive, grow, and be caught again.

**Stringing or securing fish**

*Keep the fish you catch separate from other people's so they can be identified as yours.*

Stringing fish is a skill many people take for granted. However, this skill can affect your overall success in several ways. Wet burlap bags and pointed sticks have been replaced by more modern methods.

Metal clip stringers are a popular method of stringing fish today. They are strong, easy to use, and inexpensive. They also do a better job of keeping fish alive than do the popular cord stringers. A major disadvantage of metal stringers is their use in boats. A metal stringer banging against the sides of a boat can scare fish for several hundred feet. Rubber coated or nylon clip stringers cost a little more, but are much quieter to use.

If you plan to fish all day without returning to camp, a stringer is not a good method of securing fish because the fish cannot survive for long. You can increase the effectiveness of a stringer by adding a 5- or 6-foot extension to it. This will place the fish deeper, away from the warm surface water. Fish decay rapidly after death, so it is imperative to keep them alive as long as possible. A live well with an aerator is the most effective method of keeping fish alive, but cost and weight limit its use. A wire basket is a good second choice to keep fish alive for long periods of time.

An important point to remember when stringing or securing fish is that state law requires each person to have his or her own personal method of securing fish so they are separate and distinctly identifiable from other people's. If a stringer is left unattended, it must be labeled with the name and address of the taker.

## Basic First Aid Common to Sport Fishing

*Pulling out the hook.*

*Pushing the hook on through the skin.*

A common accident among fishermen, even expert fishermen, is hooking one's self or partner instead of the fish. Fishermen have managed to hook themselves in all parts of their anatomy, but the most common places are the back, scalp, and fingers. These wounds are seldom serious, but because hooks are often rusty or dirty, there is always concern about infection or tetanus.

Some hooks can be removed by placing a piece of heavy monofilament around the bend of the hook and gently, but quickly pulling straight back. The key is pulling the hook out at exactly the angle it entered. As you pull, push the hook away from the direction the barb is pointed. This will prevent the barb from catching. If this method fails to remove the hook easily, keep the hook immobile and seek out a medical facility to have the hook removed.

Another method recommended by Dr. William Forgey in his book *Wilderness Medicine* is to push the hook the rest of the way through the skin, following the natural curve of the hook, then cut off the barb and pull the hook back through the original wound. Have a pair of side cutting wire cutters in your tackle box for this purpose. If this method might endanger any vital structure, secure the hook with tape and get to a medical facility.

Following hook removal, wash the wound and swab it with alcohol. Then consult a physician as to whether you need a tetanus shot.

A treble hook can present more of a problem. If attached to a lure, the hook should be snipped free of the plug. If only one of the three points is embedded, the same procedures can be used to remove it. If more than one point is embedded, immobilize the hook and seek a medical facility.

### Sunburn

The best first aid for sunburn, as with any injury, is prevention.

Sun rays reflecting off water can give you double exposure. Two hours of exposure on the water can equal four hours exposure on land.

Suntan lotions and sunscreens are available for all skin types. These should be a part of your fishing tackle. A wide brim hat or billed cap will help shade your head and face. Sunglasses are also important to reduce the glare from the water.

### Insect bites

Many fishing trips are ruined by pesky biting insects. Mosquitoes, flies, ticks, and chiggers seem to take great delight in biting fishermen.

You can protect yourself with any of the many good insect repellents on the market. Be sure, however, to wash your hands after applying repellent so you don't contaminate

your bait or lures. Insect repellent on your bait or lure will repel fish just as effectively as it repels insects.

Also be prepared to treat bee stings since many bees gather near water in summer.

**Snakebites**

Rarely will you encounter a poisonous snake in Missouri. If you do, however, leave it alone.

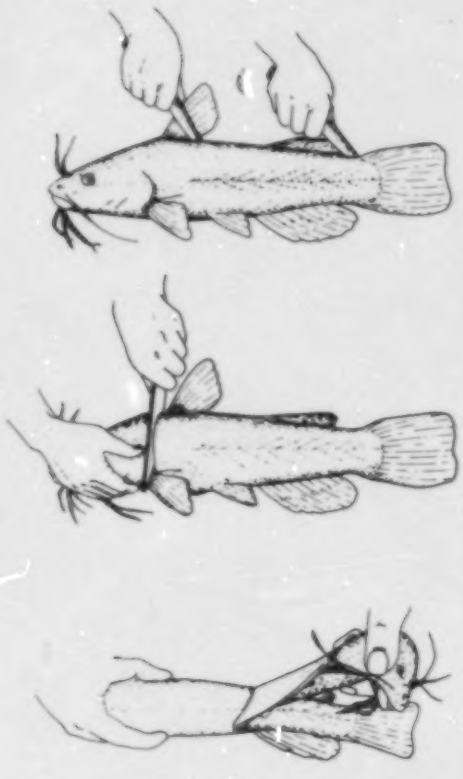
The treatment for snakebite has been debated and changed over the years. The best advice is to keep the bitten person calm and get to a doctor as soon as possible.

**Cuts and puncture wounds**

A simple first-aid kit should be a part of your fishing tackle on every fishing trip. Wash cuts or puncture wounds with soap and water and then swab with an antiseptic such as alcohol. If needed, apply a bandage. If the wound is severe, seek immediate medical treatment.

## Cleaning and Preparing Your Catch

*Skinning a fish*



As was mentioned, responsible fishermen should know how to care for their catch so they don't waste it. Knowing how to properly clean, store, and cook your fish is as important as knowing how to catch the fish.

There are probably as many different ways to clean a fish as there are fishermen. The method or technique used will depend on the species of fish, method of cooking, and the personal preference of the fisherman.

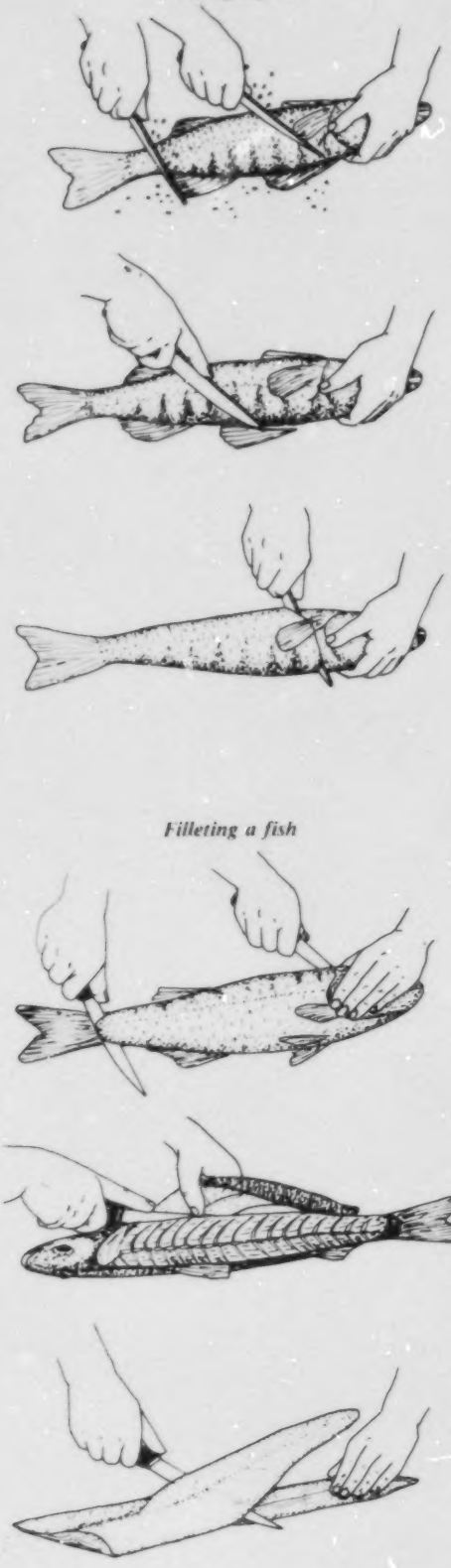
Learning to clean fish by trial and error can waste a lot of fish. You should learn some basic techniques and then perfect and modify them through practice to meet your needs.

**SKINNING**

Catfish don't have scales, so they are most often skinned. You should always make sure the fish is dead before pulling off the skin. If the fish were still alive, pulling the skin off would cause blood to flow into the meat. This would give the meat a more fishy taste, which most people don't like.

To skin a catfish, start the knife behind the adipose fin and cut the skin along the back until your knife blade reaches the dorsal fin; then cut through the fish behind the head down to the backbone. Next, bend the head down and break the backbone; then insert your forefinger over the end of the backbone and into the rib cage. Get a firm grip. Now, slowly pull the head toward the tail. The fish is now ready to wash and cook or freeze. If it's a longer catfish, you may want to cut the meat into steaks.

*Scaling a fish*



*Filleting a fish*

## SCALING

Panfish have scales, so they should be scaled first. To scale a fish, lay it flat and hold the head. Then using a scaler or knife blade, start at the tail and scrape toward the head. This will cause the scales to fly off. When one side is completed, turn the fish over and repeat the process. Next, cut off the dorsal and anal fins by running the knife point along each side of the fin base, then pull free. Cut the body at an angle behind the head. This will eliminate the head, entrails, and most of the rib cage. The tail can now be cut off. The fish is ready to wash and cook or freeze.

## FILLETING

Filleting is a fast method of cleaning fish that provides a maximum of meat and a minimum of bones. A fillet knife, which has a long, slender, flexible blade, is needed for this procedure.

To start a fillet, cut diagonally from the top of the back to the belly, behind the pectoral and pelvic fin; do not cut the backbone. Next, cut along the backbone on one side of the dorsal fins. Slice at an angle without cutting the rib cage to a point just behind the anal opening. Then slice along the edge of the anal fin with the blade flat against the backbone. Continue to slice to the tail.

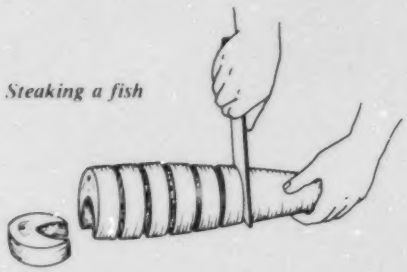
Now lay the free meat back carefully and cut it away from the rib cage. Cut through the skin to free the fillet. Turn the fish over and repeat. Lay fillet skin down on a flat surface. Hold the tail and cut through the meat down to, but not through, the skin. Rotate the knife blade so it is at an angle away from the tail. Pull on the skin and use the knife in a cutting motion. Don't try to slice the meat off, rather scrape it off with the blade and a pulling motion.

The fillet is now ready to clean and cook. Some bony fish fillets, like redhorse suckers or carp, can be improved by "scoring" the meat: slicing down through the fillet almost but not quite clear through. Repeat at about 1/8-inch intervals along the fillet. This cuts up the bones so they will cook away in hot grease.

## STEAKING

Large fish are often steaked before cooking. After the fish is cleaned, it is laid on a cutting board. Using a sharp knife, cut down all the way through the fish. Repeat this at intervals that will give you the thickness of steaks you desire.

*Steaking a fish*



## STORING

Remember that fish decay rapidly after they die. They should be cleaned as soon as possible and put on ice or frozen. Fresh fish will always taste better than frozen fish. The longer a fish is frozen, the "fishier" or oilier it seems to taste.

## COOKING

*Note to instructor:*
*For recipes on cooking fish, consult* ***Cy Littlebee's Guide to Cooking Fish and Game****, available from the Department of Conservation for $1.50.*

There are probably as many different methods of cooking fish as there are methods of cleaning them. The method and recipe used will depend on personal preference and taste.

Most recipe books include a section on cooking fish. Some fish recipes have been guarded as family secrets for generations. The good thing about fresh fish is that you really have to work hard to make it taste bad.

*Here is a recipe used in workshops by Outdoor Skills Education Specialist Wayne Martin:*

**Poor Man's Shrimp**

Small bass fillets
Package of Shrimp Boil
Salt
Pan of ice water
Wire basket smaller than cooking pan
Water

Cut fillets into ½- to ⅝-inch strips. Salt to taste. Drop into boiling water (to which Shrimp Boil has been added). Let boil for 2 minutes, then remove and place in ice water. When chilled, eat like shrimp with a sauce mixed in the proportion of 1 tablespoon horseradish to ¼ cup catsup.

## Summary

The knowledge contained in this module should serve as a good foundation or starting point for a new fisherman. Some of the most fun and exciting things about fishing are the ongoing experimentation and learning that takes place every time you go fishing. Fishing is a great family recreational sport that should last for many more generations to follow.

## Lesson Plans

The following lesson plans are offered as a suggested and field-tested means of teaching this subject material. Times are estimated for a 50-minute class period; however, the time needed for each lesson may vary depending upon the teacher and class. Pages in the appendix may be reproduced for distribution to class members.

### ADAPTABILITY TO THE DEVELOPMENTALLY DISABLED

Basic fishing can be adapted to meet specific needs of developmentally disabled individuals. In most cases only a bit of ingenuity and minimal materials will be needed. For instance, rod holders can be fastened to wheelchairs or to a belt worn by individuals who do not have use of both hands. Many sporting good stores sell a device for tying knots which would help those who may have difficulty.

Fishermen confined to wheelchairs can land their own fish with a long-handled net. For those with little dexterity, the cane pole may be the best piece of equipment because of its simplicity. A bell fastened to the rod, line, or bobber alerts anyone with a sight problem that a fish is on the line.

Safety precautions are particularly important near the water. Brakes on wheelchairs should be checked to make sure they are secure and the chairs are stable. If wheels are wet, brakes may slip, so it's a good idea to block wheels.

Fishing from a boat with pivoting chairs removes handicaps for many people. A life jacket, however, should be worn at all times by anyone in a boat or on land who cannot swim or would be helpless in the water. When fishing with individuals who will need extra help and observation, groups should be kept small or assistants recruited.

## No. 1

**Title:** Introduction, Fishing Ethics

**Method:** Lecture, discussion, activity

**Time:** 50 minutes

**Purpose:** Students will be able to do the following:

1. Name two factors that affect good fishing in this state.
2. List five fisheries management programs of the Department of Conservation.
3. Describe how fishermen help provide financial support for fisheries research and programs.
4. Describe how water quality affects fish populations.
5. List three causes of water pollution in Missouri.
6. Explain the importance of good fishing ethics.
7. Demonstrate how to use the *Wildlife Code of Missouri* to look up a regulation.

**Instructional Aids:**

1. One Missouri *Wildlife Code* for each student
2. Various personal flotation devices

**Facilities:** Classroom

**Outline:**

I. Introduce class to objectives.
Read objectives as listed under "Purpose."

II. What makes for good fishing in Missouri?

A. Good fisheries management

1. The concept of what is good fisheries management has changed through the years.
   a. In the 1930s management centered around the idea of stocking fish to insure good fishing.
   b. Statewide system of hatcheries and rearing areas were operated to produce fish.
   c. From 1939 to 1941, the Department of Conservation began to concentrate on habitat problems, such as poor land use, which can lead to the filling in of streams. The Fisheries Section worked on increasing the food supply of fishes.
   d. Since 1948, hatchery production has become a supplement to fisheries management which now includes habitat improvement and construction of new fishing waters.
   e. In the 1950s, the Department began constructing public fishing lakes and encouraging landowners to build ponds.

**Teaching tip:**
*If possible, try to schedule a local fisheries biologist to speak to the class on fisheries management. If a fish hatchery is in your area, arrange a tour.*

2. The Department has many active fisheries management programs today:
   a. Education
   b. Research
   c. Lake and stream management
   d. Water quality investigation
   e. Warm and cold water hatcheries
   f. Introduction of new species
   g. Development of public use areas
   h. Regulations and wildlife law enforcement
3. The Fisheries Division is involved in:
   a. Restoring and developing aquatic habitat
   b. Providing recreational opportunities
   c. Insuring species diversity, including non game species such as mussels
   d. Sponsoring Kids Fishing Day programs
4. Fishermen help support fisheries management programs by paying an excise tax on fishing equipment.
   a. The Dingell-Johnson Act (1950) put a tax on fishing equipment.
   b. States can receive 75 percent federal funds on a project by putting up 25 percent of the cost.
   c. In 1984 a new bill, Wallop-Breaux, added items that could be taxed, therefore further increasing available funds.

B. Water quality
1. Any lowering of water quality has prolonged effects on fish populations and fishing success.
2. Sources of water pollution in Missouri include:
   a. Municipal and industrial discharge
   b. Mine drainage
   c. Agricultural chemicals
   d. Siltation from mismanagement of lands adjacent to streams and lakes
3. Offensive taste of some fish from Missouri and Mississippi rivers is caused by pollution and has contributed to a decline in commercial fishing.
4. Stream channelization has had an impact on fish habitat.
5. When a pollution-caused fish kill occurs, the Department of Conservation investigates. Polluters may be taken to court and fined.

III. Ethics
A. In any sport you will encounter slobs: people who bend or break the rules in an irresponsible manner.
B. The future of sport fishing can be insured by fishermen working together to educate and cure unethical or slob fishermen.
C. Discuss litter.
D. Discuss fishing safety.

**Note to instructor:**
*When discussing safety, have on hand several personal flotation devices to show the class. Demonstrate how to use each type and discuss the effectiveness.*

E. Discuss landowner relations.
F. Discuss sportsmanship.
G. Discuss laws and regulations.
H. Discuss conservation.

**(Class activity)**

IV. Using the Wildlife Code
A. Point out to students that they need to be familiar with the *Wildlife Code of Missouri* (pass out copy to each student). It is the set of rules published each year by the Department of Conservation.
B. Remind students that ignorance of the law is no excuse.
C. Using the code book, ask several questions and have students look up the answers. Sample questions:
1. Who is exempted from needing a fishing permit?
2. What are the legal methods of taking fish?
3. What should you do if you snag a fish that isn't a paddlefish?
D. Remind students that if they don't understand a regulation, to check with their conservation agent or contact the Department of Conservation.

## No. 2

**Title:** Casting With Spin-Casting Tackle

**Method:** Lecture, demonstration

**Time:** 50 minutes

**Purpose:** Students will be able to do the following:
1. Explain the role casting plays in successful sport fishing.
2. Demonstrate how to properly operate a spin-casting rod and reel for casting.
3. Explain the mechanics of casting.

**Instructional Aids:** A spin-casting rod and reel with practice plug

**Facilities:** Gymnasium

**Outline:**

I. Introduction of Objectives
Read objectives as listed under "Purpose."

**(Lecture)**

II. Lesson Introduction
A. Successful sport fishing can be divided into two main parts.
1. Effective casting
2. Knowledge of the fish being pursued
B. The skill of casting can be learned by study and practice.
C. The knowledge of fish and how to entice them to bite is best learned through years of experience.

D. A beginner should first concentrate on learning to cast.

III. Plug Casting

A. The ability to cast is like any other skill: proficiency comes only after learning the fundamentals and then practicing to perfect them. To be a successful fisherman, these fundamentals must be practiced until they become second nature.

B. The skill of casting can be divided into three major categories: (1) accuracy, (2) distance, and (3) versatility.

1. Accuracy is the most important category.
   a. Ask: What is accuracy?
      Answer: The ability to cast a plug or bait to the spot you want it to land.
   b. Ask: Why is accuracy important?
      Answer: Accurate casting allows the fisherman to cast to likely looking spots without getting "hung up."
2. Distance is an important factor, but should only be practiced *after* an acceptable level of accuracy has been achieved.
   a. Ask: Is trying to cast as far as possible important?
      Answer: Not nearly as important as accuracy. Distance without accuracy is useless. First learn accuracy, then work on distance.
   b. Distance is an important part of accuracy. The ability to judge the distance to a target and then cast that distance is critical to accuracy.
   c. The ability to judge distance can mean the difference between catching a big bass or catching a big tree limb.
   d. Casting for long distances is a skill that is not often needed. Most fish are caught between 20-60 feet from a fisherman.
3. Versatility is the third category involved in the skill of casting. Versatility is the ability to adapt to all sizes and weights of lures or bait and to all situations encountered while casting.
   a. In most skills involving accuracy you strive for consistency. This is much easier when the object, such as a baseball, bowling ball, or dart, always weighs the same and is shaped the same.
      Ask: Is this possible for fishermen?
      Answer: No, their baits and lures are as varied in weight and shape as are the fish they are seeking.

b. When practicing for accuracy and consistency, you strive to always perform the fundamentals of the skill exactly the same, every time.
(1) Ask: Is this possible for a fisherman to do?
Answer: No, fishermen must be able to cast from a standing or sitting position; from rocky shorelines, bouncing boats, open water; and from beneath and around tree limbs and brush.
(2) So a fisherman, to be successful, must be versatile.
c. Versatility, like accuracy and distance, can be learned through practice.
(1) This can be accomplished by varying the weight of your practice plug and the distance you are casting.
(2) You should also vary the types of cast you use.

C. Practice is the key to successful casting.
1. You don't need a river, lake, or pond to practice. All you need is a rod, reel, practice plug, and yard.
2. Practice plugs are available in all shapes and sizes at most sporting goods stores.
a. The best kinds are made of rubber with a metal eye for attaching the line.
b. You should practice with different weight practice plugs to gain versatility.
3. Once you have studied the correct fundamentals of casting, practice can begin.
a. A good way to practice is to roam around your yard or a park and pick out targets to cast at: a tree, a leaf, a rock can all be potential targets.
b. Never cast toward people or a building. Rubber practice plugs can cause eye injuries and break windows.
4. It is very important that you practice the correct casting fundamentals first and then practice for accuracy. The old saying "practice makes perfect" is true, but unless you first learn the proper way to cast, you are only making yourself better at doing something wrong.

**(Demonstration)** IV. Fundamentals of Casting a Spin-Cast Reel
A. Discuss and demonstrate the proper grip.
B. Aiming and the back cast fundamentals will be discussed individually when the various casts are covered.
C. Discuss and demonstrate how to release the button as the plug is cast.
D. Discuss and demonstrate the two methods of

adjusting the distance of a cast while the plug is in the air.

1. Pushing button
2. Feathering the line

E. Discuss and demonstrate the proper method of retrieving line.

**(Lecture)** V. Mechanics of Casting

A. Two basic principles of casting are:
   1. To get distance, the rod must bend.
   2. To get accuracy, all or most of the variables must be eliminated.

B. The key to good casting is the rod and the arm and wrist action of the caster.
   In order to be a good caster, it is necessary to master rod handling fundamentals. Once these are learned, mastering accuracy and distance will be easier.

C. The first mechanical principle of casting is—the more the rod bends, the more distance you will get.
   1. A relaxed rod is naturally straight. Hold up rod and demonstrate.
   2. When the casting action forces it to bend, it will try to return to a straight condition—in other words "snap back." This snap back produces the cast by giving motion and speed to the plug. (Bend rod and let it snap back.) The farther a rod is forced to bend, the farther and faster it will snap back.

D. Discuss and demonstrate a one-stroke cast.

E. Discuss and demonstrate a two-stroke cast.

F. Accuracy is accomplished by eliminating the variables.
   1. The most common variable is the point at which the plug is released.
      a. The plug should always be released smoothly and at the same place in the casting arc.
      b. The release of the plug should be a reflex action and must happen quickly. This reflex is acquired through practice.
      c. The caster's eyes should focus on the target and the reflex release of the plug will be automatic.
   2. Another common variable is the vertical angle of the rod at the release.
      a. The rod should be kept as near vertical as possible throughout the cast to eliminate side-to-side variables. (demonstrate)
      b. Always hold the rod in front of your body in a vertical plane in front of your right eye. (demonstrate)
      c. The rod must remain perfectly vertical during the entire back cast and release. This

ensures the plug will always be in direct line with the target. (demonstrate)

3. Arm and wrist action are just as important to accurate casting as rod control.
   a. The best rule of thumb is to do what feels natural, while maintaining good rod control.
   b. Most good casters will develop, through practice, a wrist and arm coordination that best suits them.
   c. Demonstrate proper arm and wrist action. Point out that the arm does *not* move in average distance casts.

## No. 3

**Title:** The Overhand Cast for Accuracy

**Method:** Lecture, demonstration, class activity

**Time:** 50 minutes

**Purpose:** Students will be able to do the following:
1. Explain the importance of casting safety.
2. Cast safely.
3. Demonstrate the correct fundamentals of the overhand cast for accuracy.

**Instructional Aids:**
1. Spin-cast rods and reels (at least one for every 3-4 students)
2. Casting targets (at least one for every 4 rods and reels)
3. Rubber casting plugs 1/4 to 3/8 ounce (one for every rod, plus a few extras)

**Facilities:** Gymnasium or playground

**Outline:**

I. Review Lesson 1.
   Answer questions

II. Introduce objectives.

**(Lecture)**
   Read objectives as listed under "Purpose."

III. Casting safety is important at all times.
   A. The fisherman is responsible for the plug or bait from the time the cast is begun until the time the plug or bait is retrieved.
   B. A caster must always look behind him before a cast is started.
      1. Make sure no one is behind you.
      2. Also check for obstacles that might interfere with your cast.
   C. Never cast toward anyone.

D. Another part of casting safety is freeing snagged lures.
   1. When a line is snagged, never pull on the line with your hand. Monofilament line can cut like a knife.
   2. If you must pull, wrap the line two or three times around the rod handle and pull on the rod handle, not the line.
   3. When pulling on a snagged line, the lure may pull loose and come toward you at a high rate of speed.
      a. To avoid getting hit, never pull directly toward you. Hold the rod to one side.
      b. Also alert anyone around you before you begin to pull.

E. Casting safety, like all kinds of safety, involves using good common sense.

**(Demonstration)**

IV. Discuss and demonstrate the overhand cast for accuracy.

A. The overhand cast is the most commonly used of all casts. It should be perfected before practicing other casts.

B. Demonstrate and discuss the following:
   1. Overhand cast
   2. Stance
   3. Grip
   4. Aiming
   5. Rod action of cast
   6. Release and follow-through
   7. Feathering
   8. When to use overhand cast
   9. Overhand cast for review

C. Divide class into the number of groups that you have rods and reels or space to accommodate.

D. Allow class to practice the overhand cast at targets 40 to 50 feet.

**Note to instructor:**
*Targets can be spaced so that two to four casters can cast at the same target.*

## No. 4

| | |
|---|---|
| **Title:** | Practicing the Overhand Cast for Accuracy |
| **Method:** | Review and class activity |
| **Time:** | 50 minutes |
| **Purpose:** | Students will be able to hit a 30-inch diameter casting target at least 1 out of 10 casts at a distance of 40 feet using the overhand cast for accuracy with spin-casting tackle. |
| **Instructional Aids:** | Same as Lesson 2. |
| **Facilities:** | Gymnasium or playground |

**Outline:**

**(Class participation)**

I. Review the overhand cast fundamentals.
II. Put class back into groups. Allow class to practice the overhand cast at targets 40 to 70 feet.

## No. 5

| | |
|---|---|
| **Title:** | The Lob Cast |
| **Method:** | Lecture, demonstration, class activity |
| **Time:** | 50 minutes |
| **Purpose:** | Students will be able to do the following:<br>1. Demonstrate the correct fundamentals of the lob cast.<br>2. Explain when to use the lob cast. |
| **Instructional Aids:** | Same as Lesson 2, plus at least one 1/2- to 5/8-inch flat washer for each rod. |
| **Facilities:** | Gymnasium or playground |

**Outline:**

**(Demonstration)**

I. The Lob Cast
   A. The lob cast is used when fishing live or prepared bait.
   B. Demonstrate the fundamentals.
      1. Demonstrate the lob cast.
      2. Demonstrate and discuss the stance.
      3. Demonstrate and discuss the grip.
      4. Demonstrate and discuss the aiming.
      5. Demonstrate and discuss rod action for the lob cast.
      6. Demonstrate and discuss release and follow-through.

**Teaching tip:**
*A good way to practice this cast is to tie on a practice plug, then take a 3-foot piece of monofilament line and tie a 1/2-or 5/8-inch flat washer to one end. Tie this line and washer to the practice plug. In this setup the practice plug simulates a bobber while the flat washer simulates the hook and bait hanging about 3 feet below it.*

7. Demonstrate and discuss feathering.
8. Discuss when to use this cast.
9. Demonstrate lob cast for review.

C. Divide class into groups and allow members to practice the lob cast.

## No. 6

**Title:** The Knowledge of Fish and Their Surroundings

**Method:** Lecture and demonstration

**Time:** 50 minutes

**Purpose:** Students will be able to do the following:
1. Identify at least five of the common Missouri sport fishes.
2. Explain and demonstrate how to use a sinker.
3. Explain and demonstrate how to use a bobber.
4. Explain and demonstrate how to rig a bait worm.

**Instructional Aids:**
1. Spool of about 8-pound monofilament line
2. Pair of scissors
3. Assorted sinkers
4. Assorted bobbers
5. Assorted hooks
6. Assorted rubber imitation live baits
7. Jar of prepared bait

**Facilities:** Gymnasium

**Outline:**

I. Introduction of Objectives
Read objectives as listed under "Purpose."

(Lecture)

II. Knowledge of Fish and Their Surroundings
- A. Another key to successful fishing besides accurate casting is your knowledge of the fish you are pursuing.
- B. Knowing a fish's habits and habitat allows you to choose the most likely places to fish and what bait or lure to use.
- C. Fishing success is usually greater when you concentrate on one species at a time.
  1. Casting a gob of worms to catch anything that swims by will often produce some fish. However, rigging your tackle, picking a spot and time of day for a particular species of fish, will oftentimes produce more fish.
  2. This doesn't mean you can't fish for more than one species of fish on a fishing trip. It just means you should concentrate on one species at

a time, using your knowledge of that species' habits and habitat to increase your success.

D. You should also be able to identify the fish you catch. This is important so you can obey the laws pertaining to limits and seasons.

E. Hand out and discuss booklet on Missouri sport fishes.

F. Optional—Show fish identification slides if you have any.

III. Bait and Lure Selection

**Note to instructor:**
*To obtain sport fishes booklet, write Missouri Department of Conservation, P.O. Box 180, Jefferson City, MO 65102.*

A. Once you select what species of fish you are going to try to catch, you can select a bait or lure to use. The type of bait or lure you select will dictate somewhat the type of tackle that will be needed. For example, a fast retrieved lure would not be practical for cane pole fishing.

B. Natural or live baits can be used to catch all of the common species of fish in Missouri.

C. Artificial lures can be effective on some species, but almost useless on others.

D. Proper bait and lure selection can mean the difference between catching fish and not getting a bite.

E. In selecting bait and lures all you are really trying to do is present a fish with a bait that is part of his regular diet or a lure that simulates something in his diet.

IV. Natural Baits

A. The proper use of natural baits is as important as proper selection. Most natural baits are used in a technique called "still fishing."

1. Still fishing is casting a bait to a likely spot and waiting for the fish to bite.
2. There are two main methods of still fishing.
   a. One involves fishing the bait on the bottom, often called tight-line fishing.
   b. The other uses a bobber to suspend the bait, often called bobber fishing.

B. When fishing live or natural baits, a sinker or weight is required to hold the bait down.

**(Demonstration)**

1. The weight of the sinker should be just heavy enough to get the bait down and hold it there.
2. Sinkers come in many weights and styles.
   a. Demonstrate a pinch-on sinker and discuss its uses.
   b. Demonstrate a sliding sinker and discuss its uses.

C. When fishing a bait suspended off the bottom, use a float or bobber.

1. Bobbers come in many shapes and sizes.
   a. Size selection is very important.
   b. Using a large bobber when fishing for small panfish, such as bluegill, makes setting the

hook difficult. The large bobber offers too much resistance and the fish easily steals your bait.

2. Demonstrate and discuss a clamp-on bobber.
3. Demonstrate and discuss a sliding bobber.

D. Demonstrate and discuss how to rig various *common live baits such as worms, minnows,* crayfish, crickets, and frogs.
E. Demonstrate and discuss how to rig prepared baits.
F. Demonstrate and discuss various styles and sizes of hooks to use for live and natural baits.
G. Demonstrate and discuss how to tie the improved clinch knot (see *Casting Equipment* module).

**Teaching tip:**
*Artificial rubber worms, minnows, frogs, and others are available at most bait and tackle stores. These work well in the classroom for simulating how to rig live bait.*

## No. 7

**Title:** Artificial Lures and Fishing Accessories

**Method:** Lecture and demonstration

**Time:** 50 minutes

**Purpose:** Students will be able to do the following:
1. Discuss the techniques of rigging and fishing the common types of artificial lures.
2. Discuss the importance of common fishing tackle items and accessories.

**Instructional Aids:**
1. Samples of the general categories of artificial lures
2. "Plug-nocker" and cord
3. Spin-cast rod and reel
4. Samples of various fishing tackle items and accessories

**Facilities:** Gymnasium

**Outline:**

I. Introduction of Objectives
Read objectives as listed under "Purpose."

**(Lecture)**

II. Artificial Lures
A. They come in all sizes, shapes, and colors.
B. Some sink, some dive, some float, some vibrate, some rattle, and some pop.
C. Artificial lures all try to resemble minnows, baitfish, crayfish, frogs, snakes, worms, mice, birds, or other assorted fish food.
D. Some artificial lures have a built-in action when retrieved; others must be provided action by the fisherman.
E. A good rule of thumb is to select a few good lures for the species of fish you plan to fish for and then perfect your use of these lures.

**(Demonstration)**

F. Artificial lures can be grouped into general categories. Demonstrate and discuss at least one lure from each category.
   1. Topwater or surface
   2. Floating-diving
   3. Deep-running
   4. Spoons
   5. Jigs
   6. Spinner baits
   7. Spinners
   8. Soft plastic lures

G. Proper care of artificial lures is important.
   1. Keep hooks sharp and rust-free.
   2. Keep hard and soft bodied lures stored separately.
   3. Repaint when needed.
   4. Demonstrate how to use a "plug-knocker."

**(Lecture)**

III. Fishing Tackle and Accessories
   A. Discuss selection of rod, reel, and line from *Casting Equipment* module.
   B. Discuss selection and use of tackle boxes.
   C. Discuss selection and use of landing nets and gaff hooks.
   D. Discuss selection and use of various hand tools available to fishermen.
   E. Discuss selection and use of various fish-cleaning tools.
   F. Discuss selection and use of various stringers and bags.

## No. 8

**Title:** Fishing Skills Other Than Casting

**Method:** Lecture, demonstration

**Time:** 50 minutes

**Purpose:** Students will be able to do the following:
1. Discuss fishing skills, other than casting, important to successful sport fishing.
2. Discuss basic first aid common to sport fishing.

**Instructional Aids:**
1. Spin-cast rod and reel and practice plug
2. Various fish stringers
3. Fish hook and monofilament line
4. Orange

**Facilities:** Gymnasium

**Outline:**
**(Lecture)**

I. Introduction of Objectives
Read objectives as listed under "Purpose."

II. Locating Fish
A. The secret to finding fish is understanding their basic needs.
B. Basic needs of fish fall into three basic groups: food, oxygen, and shelter. If any of these three are missing, fish won't be present.
1. Food is required by fish as with any living organism.
a. If food is not close at hand, fish will seek it out.
b. Many times fish will move out of their shelter during early morning and late evening to feed aggressively.
c. Knowing what food a particular species of fish feeds on will help you select the correct bait or lure.
2. Just as we require oxygen, so do fish.
a. Some species of fish require a different minimum level of oxygen than others.
b. A clear-running stream will tend to contain more oxygen and suitable habitat for some species than a small, shallow, muddy pond.
c. Oxygen levels will fluctuate in most bodies of water, so fish tend to move around to locate the minimum oxygen level they need.
3. A fish requires more than water for shelter. Shelter provides shade from bright sunlight, a place to hide from predators, and a place for predator fish to ambush smaller fish.
C. Food, oxygen, and shelter are basic needs, but many other factors can assist in locating fish. Such factors as water temperature, water pH level, migration, spawning, and other considerations can be important in locating fish. (These factors will be dealt with in the module on *Advanced Sport Fishing*.)
D. Structure fishing and pattern fishing are terms that are becoming a part of the fishing vocabulary. To put it simply—structure fishing involves locating fish and pattern fishing involves getting them to bite.
1. Structure fishing
a. Reading water is an important skill when trying to locate fish. It is the key to structure fishing.
(1) Reading water is the ability to look over a body of water and select likely looking spots to fish.
(2) It has been said that 90 percent of the fish in a body of water can be found in 10 percent of the water. The ability to

read water allows you to save time and effort by eliminating that 90 percent of the water with no fish and concentrate on the 10 percent with fish.

(3) The skill of reading water is gained by knowing the three basic requirements of fish and experimenting.

(4) By studying a body of water and the structure above water, you can usually get a good idea as to what the underwater structure is like. Modern depth finders and fish locators can take the guesswork out, but these are fairly expensive and somewhat restricted to boat fishing. (Depth finders, fish locators, and other devices will be covered in the *Advanced Sport Fishing* module.)

b. Again, structure fishing involves locating fish.

(1) Largemouth bass don't like bright light, so on bright sunshiny days, the smart fisherman will eliminate shallow or open water and concentrate on shaded areas.

(2) It has been said you can find structure without fish, but you can't find fish without structure.

2. Pattern fishing

a. Pattern fishing involves trying to get fish to bite. To get fish to bite, a basic understanding of their senses will help.

b. Fish have the same five senses we do—sight, touch, smell, taste, and hearing. They use as many of their senses as possible when feeding.

c. When possible, fish use their sight to locate food.

(1) In clear water, sight is more important than in muddy water.

(2) When fishing clear water, you want your bait or lure to look natural.

(3) Fish can see colors; this is why natural colored lures are popular in clear water fishing.

(4) Colors are a result of light reflection and since little light penetrates deep water, natural colors aren't as important in deep water fishing.

(5) Highly reflective colors such as blue, green, or chartreuse are popular colors in deep-diving lures.

d. Fish have a good sense of smell and taste.

(1) Smell coincides with taste, so if a bait

smells good, the fish assumes it will taste good.

(2) Outboard motor oil, gas, or insect repellent on your hands is a surefire way not to catch fish.

(3) In muddy or dark water, fish rely heavily on their sense of smell and taste to locate food.

(4) Some fishermen even use commercial fish-attracting scents to spray on their lures before fishing.

(5) Some fish such as channel catfish and carp have barbels or whiskers that contain olfactory areas and taste buds. This means they can smell and taste their food before even taking it in their mouth.

e. Fish have a much keener sense of hearing than we do.

(1) Some fish rely heavily on their sense of hearing, or ability to feel vibrations, to locate food. Bass, feeding at night can't see much, but they can hear. This is why noisy surface lures are popular with night fishermen.

(2) Unnatural noises can spook fish. Walking noisily along a stream bank can spook fish a long way off. A good way *not* to catch fish from a boat is to shut your motor off right over the spot you plan to fish, throw the anchor, bang open a tackle box, drop a can of pop, and cast your lure so it splashes two gallons of water into the air.

(3) Think *quiet* when fishing.

3. Trolling

Trolling is one other common way to locate fish. When trolling, you select a lure and cast behind the boat. You then run the boat and motor slowly, crisscrossing over a body of water until a fish strikes.

III. Fishing Skills Other Than Casting

A. The ability to know when and how to set a hook is an important skill in successful fishing.

B. Knowing *when* to set the hook will come with experience. Knowing *how* to set the hook can be practiced.

**(Demonstration)**

1. Demonstrate and discuss how to set the hook properly.
2. Demonstrate and discuss how to play a fish properly.
3. Demonstrate and discuss how to land a fish properly.

4. Demonstrate and discuss how to release fish properly.
5. Demonstrate and discuss various ways of stringing or securing fish.

**(Discussion)**

IV. Basic First Aid Common to Sport Fishing
- A. Demonstrate and/or discuss hook removal.
- B. Discuss sunburn.
- C. Discuss insect bites.
- D. Discuss snakebites.
- E. Discuss cuts and puncture wounds.

**Teaching tip:**
*An orange makes a good teaching aid to demonstrate hook removal.*

## No. 9

**Title:** How To Clean Fish

**Method:** Lecture, demonstration

**Time:** 50 minutes

**Purpose:** Students will be able to explain and demonstrate some of the common methods of cleaning fish.

**Instructional Aids:** Fish cleaning tools

**Facilities:** Gymnasium

**Outline:**

I. Introduction of Objectives
Read the objective listed under "Purpose."

**(Demonstration or Discussion)**

II. Cleaning and Preparing Your Catch
- A. Demonstrate and/or discuss skinning.
- B. Demonstrate and/or discuss scaling.
- C. Demonstrate and/or discuss filleting.
- D. Demonstrate and/or discuss steaking fish.
- E. Discuss proper ways of storing fish.
- F. Discuss methods of cooking fish.

**Teaching tip:**
*Local commercial fishermen or fish farms are often willing to visit classes to demonstrate proper fish cleaning techniques. Local fishermen are also sometimes willing to assist you in teaching fish cleaning.*

## No. 10

**Title:** Special Casts

**Method:** Demonstration and/or class activity

**Time:** 50 minutes

**Purpose:** Students will be able to discuss and/or demonstrate the following casts:
sidearm cast
flip cast
bow cast
pendulum cast
distance cast
two-hand cast

**Instructional Aids:**
1. Spin-casting rods, reels, and practice plugs
2. Casting targets

**Facilities:** Gymnasium or playground

**Outline:**

**(Lecture)**

I. Introduction of Objectives
Students will be able to do the following:
- A. Discuss and/or demonstrate the sidearm cast for accuracy.
- B. Discuss and/or demonstrate the flip cast.
- C. Discuss and/or demonstrate the bow cast.
- D. Discuss and/or demonstrate the pendulum cast.
- E. Discuss and/or demonstrate casting for distance.
- F. Discuss sitting casts and two-hand casting.

II. Special Casts
Demonstrate and/or discuss the fundamentals of the following casts and when to use them.
- A. Sidearm cast
- B. Flip cast
- C. Bow cast
- D. Pendulum cast
- E. Distance cast
- F. Two-hand cast

**Note to instructor:**
*These special casts can be demonstrated and/or discussed. If time permits, allow students to practice.*

## No. 11

**Title:** Plug Golf

**Method:** Class activity

**Time:** 50 minutes

**Purpose:** Students will understand how to play plug golf.

**Instructional Aids:**
1. Spin-casting rods, reels, and practice plugs
2. Casting targets
3. Score sheets

**Facilities:** Playground, athletic field, or large open area

**Outline:**

I. Introduce class to objective.
Students will understand how to play plug golf.

II. Explain the game of plug golf.
- A. Explain rules.
- B. Explain the plug golf course and walk class through it.
- C. Put students in groups of four and have them start the game. One group can start on each target and rotate around the course until all targets have been played.

## No. 12

**Title:** Practical Casting

**Method:** Class Activity

**Time:** 50 minutes

**Purpose:** Students will understand how to play practical casting.

**Instructional Aids:**
1. Spin-casting rods, reels, and practice plugs
2. Casting targets
3. Score sheets

**Facilities:** Large field with some trees and/or shrubbery, or athletic field

**Outline:**

I. Introduce class to objective.
Students will understand how to play practical casting.
II. Explain the game of practical casting.
A. Explain the rules.
B. Explain the practical casting course and walk class through it.
C. Put students in groups of four and have them start the game. One group can start at each target and rotate around the course.

## No. 13

**Title:** The Overhand Cast for Accuracy

**Method:** Class Activity

**Time:** 50 minutes (If time allows, this lesson plan may be repeated two or three days.)

**Purpose:** Students will be able to hit a 30-inch casting target at least 1 cast in 10, using the overhand cast for accuracy.

**Instructional Aids:**
1. Spin-casting rods, reels, and practice plugs
2. Casting targets

**Facilities:** Gymnasium or playground

**Outline:**

I. Explain objective—to be able to hit a 30-inch target at a distance of 40 feet at least 1 cast in 10, using the overhand cast for accuracy.
II. Review the fundamentals of the overhand cast for accuracy.
III. Repeat Lesson 2.

## No. 14

| | |
|---|---|
| **Title:** | Final Evaluation |
| **Method:** | Class Activity |
| **Time:** | 50 minutes |
| **Purpose:** | Students will be able to score at least 65 on the administered skill test. |
| **Instructional Aids:** | 1. Spin-casting rods, reels, and practice plugs<br>2. Casting targets<br>3. Score sheets |
| **Facilities:** | Gymnasium or playgroun[illegible] |
| **Outline:** | Administer skill test. |

## Glossary

| | |
|---|---|
| **Accuracy** | One component of casting that involves the ability to cast a plug or bait to a predetermined spot. |
| **Aerator** | An electric air pump used to maintain a sufficient oxygen level in a live bait container or live well. |
| **Aiming** | A fundamental of accurate casting where the rod is pointed at the target before casting. |
| **Anatomy** | The physical structure or makeup of a fish. |
| **Artificial Bait** | Man-made baits that tend to resemble minnows, baitfish, crayfish, frogs, snakes, insects, worms, mice, birds, or other assorted fish food. |
| **Back Cast** | The rearward motion which starts a two-stroke cast. The back cast serves to bend or "load" the rod. |
| **Bait** | An item or substance used to entice fish to bite a hook. |
| **Bait-Holding Hook** | A fish hook with barbs along its shank that aid in securing the bait. |
| **Barb** | The spur found on the point of most fish hooks that serves to increase the holding power of the hook. |

**Barbel** A whisker-like projection from the jaws of some fish, such as carp or catfish. It serves as a sensory organ to help fish smell and feel.

**Bite** The action of a fish taking the bait or lure; sometimes referred to as a "strike."

**Bobber** A floating object attached to a fishing line that suspends the bait and keeps it off the bottom; sometimes called a "float" or "cork."

**Bobber Fishing** The act of fishing a bait or lure suspended by a bobber.

**Bow Cast** A special cast used when a back cast is not possible. The lure is hand-held by the hook or behind the hook and drawn back to bend the rod. When the lure is released, the rod snaps back and shoots the lure forward.

**Built-In Action** An artificial lure that is shaped so it will imitate the action of a particular live bait when it is retrieved through the water.

**Cane Pole** Name given to fishing equipment that employs a long, slender rod and no reel. The name originated from Calcutta cane which was used to make the poles. Cane poles are sometimes called "bank poles."

**Caster** A person in the act of casting a plug or bait.

**Catfish** A group of scaleless fish named for the long barbels around their mouth that resemble "cat whiskers."

**Cleaning** The act of skinning, dressing, filleting, or preparing a fish for cooking or freezing.

**Conservation** The wise use without waste of a natural resource.

**Cove** A small bay or inlet in a body of water.

**Creel** A bag to hold fish; used most often by the wading fisherman. Made of wicker or split willow, canvas, or plastic, it is designed to keep fish as cool as possible.

**Creel Limit** The number of a given species of fish that a fisherman legally may catch and keep on any given day.

**Depth Finder** An instrument used to determine the depth of water.

**Distance** A key component in the skill of casting.

**Distance Cast** A long cast, usually more than 80 feet.

**Dorsal Fin** A fin located on the back or uppermost part of a fish.

**Drag** An adjustable tension control on reels that prevents a strong fish from breaking the line or rod. Drag is adjusted according to weight of line. Some drags, such as "star drags" are easily accessible so they can be adjusted while playing a fish.

**Dressed Up** Adding something to an artificial lure to change its appearance and/or action.

**Ethical** Judging behavior right or wrong based on a set of personal values or opinions.

**Feathering** The act of controlling the speed and distance of a cast by applying pressure to the out-going line with the thumb and forefinger.

**Fillet** A method of cleaning fish by removing a large slab of meat from each side of the fish. Also refers to a boneless slab of meat.

**Filleting** The act of cleaning fish using the fillet method.

**Fillet Knife** A knife with a long, slender, flexible blade used for filleting fish.

**Fish Getters** Lures or baits that over time have proven to be effective in getting fish to strike.

**Fish Locator** An electronic instrument that will chart, graph, or signal the presence of fish in water below a boat.

**Fish Stringer** A device used to secure fish.

**Flip Cast** Cast in which the rod tip is flipped down to bend the rod or "load" it. As the rod begins to snap back straight, the line is released and the lure is cast. It is useful when a back cast is not possible.

**Flippin'** A method of fishing using a long rod and casting the lure short distances by using a pendulum-type motion.

**Float** See bobber.

**Follow-through** The final part of a cast; it allows the casting motion to end smoothly and naturally rather than suddenly or abruptly.

**Fundamentals** The basic steps necessary to cast properly.

**Gaff** A large, strong hook attached to a handle and used in landing large fish.

**Gigging** A method of catching fish using a fish spear that has prongs like a pitchfork.

**Gill** An arch-like breathing organ located behind the gill cover on a fish's head.

**Gill Cover** The hard, bony structure that covers the gills.

**Grip** The fundamental way of grasping or holding a fishing rod in order to cast it.

**Habitat** The kind of place in which a given species of fish lives.

**Hook Remover** A tool designed to help a fisherman remove a hook from a fish.

**Hung Up** Refers to having your fishing hook or lure snagged or caught on a rock, tree, weed, or other structure. Also referred to as "snagged."

**Jigging** A method of fishing using an up-and-down pumping motion on the rod.

**Landing** The process of removing a hooked fish from the water.

**Landing Net** A small net on a frame and handle that is used to land hooked fish.

**Length Limit** A minimum or maximum size of fish that can legally be kept.

**Light Action** A rod action that when under maximum load or bend, all the curvature takes place in the upper third of the rod.

**Line-Stop** A small device fastened to a fishing line to set the desired depth when fishing with a sliding bobber.

**Live Bait** A bait that is fished while the bait is alive, such as minnows, worms, and crayfish.

**Live-Well** An aerated container, oftentimes built into a boat, that is used for storing fish and keeping them alive.

**Lob Cast** A one-stroke cast used for softly casting live or natural bait.

**Lure** Artificial bait; sometimes called a "plug."

**Mechanics** A science dealing with the motion of objects and the action of forces on the objects.

**Medium Action** A rod action that when under maximum load or bend, all the curvature takes place in the upper one half of the rod.

**Monofilament Line** A single, strong synthetic fiber used as fishing line.

**Natural Bait** Bait that is not artificial, but is organic in nature and common to a fish's environment.

**Olfactory Nerves** Nerves that allow for the sense of smell.

**One-Stroke Cast** A cast involving only a forward motion. No back cast is used.

**Overhand Cast** A casting method in which the rod tip travels through a vertical overhead arc.

**Overhanging Structures** Structures that hang over and shade the water.

**Panfish** A general classification given to small fish such as bluegill, green sunfish, and crappie.

**Pattern Fishing** The process of getting fish to bite and understanding the reasons for success so the procedure can be repeated.

**Pendulum Cast** A casting method that swings a lure or bait back and forth before it is released.

**Personal Flotation Device** A safety device designed to keep your body afloat should you enter water over your head.

**Plug** See lure.

**Plug Knocker** A weighted device used to retrieve lures that are snagged on underwater structures.

**Plug Retriever** Same as plug knocker.

**Practice Plug** A hookless, teardrop-shaped plug that comes in 1/4, 3/8, and 5/8 ounce weights.

**Predator Fish** A fish that feeds on other fish.

**Prepared Bait** An organic substance made by various recipes that is used to catch primarily bottom-feeding fish.

**Reading Water** The ability to look at a body of water and select the most likely spots which would hold fish.

**Reflex** An involuntary reaction that requires no thought.

**Release** Refers to the action of releasing the spool release button when casting a spin-cast reel.

**Rigging** The process of attaching a lure or bait to a line and modifying it if necessary for the particular situation.

**Rod Butt** The end of the rod handle.

**Rod Guide** Small rings or arches attached to a rod that keep the fishing line running parallel to the rod and help distribute stress evenly.

**Rod Handle Trigger** A projection off the rod handle of a spin-casting rod, just below the rear of the reel seat.

**Scaler** A tool used to remove scales from a fish.

**Scales** Small, flattened plates that form a protective body covering on fish.

**Scaling** The act of removing a fish's scales during the fish cleaning process.

**Scoring** A method of preparing fish by making narrow cuts almost all the way through, which then allows hot oil to cook up the small bones.

**Season** The period of time during a calendar year that a given species of fish may be harvested.

**Setting the Hook** The process of embedding a hook in a fish's mouth.

**Shelter** A form of structure that protects a fish from sunlight, predators, or anything else it is trying to avoid.

**Sidearm Cast** A casting method that keeps the rod parallel to the water throughout the cast.

**Sinker** A weight used to make a bait or lure sink. Usually made of soft lead.

**Sitting Casts** Casts made while sitting.

**Skinning** Part of a fish cleaning process where the skin is removed.

**Skinning Board** A board with spring clamp on one end to hold a fish while it is being cleaned.

**Skinning Knife** A sharp, stout, short-bladed knife used for cutting open a fish and removing the fins, tail, and head.

**Skinning Pliers** Specialized pliers made to grip slippery fish skin.

**Slob** A person who violates laws and ethics. A person who behaves in an unsportsman-like manner.

**Snag** An underwater structure that tends to cause a lure or bait to become hung up.

**Snagged** See hung up.

**Snagging** A method of catching certain species of fish whereby the fisherman casts a heavy sinker and large treble hook with no bait. The fisherman tries to hook a fish's body by making strong pulls on the rod. Also referred to as "grabbing."

**Snap Back** The recoil action of a bent rod as it straightens and resumes its original shape.

**Special Casts** Casts that are used in special situations where more common casts would not be possible.

**Species** A biological classification of plants and animals.

**Spin-Cast Reel** A reel invented in the 1940s by R.D. Hull and designed to eliminate backlashes. It is recognized by its fixed spool design and a spool release button. Also referred to as a "push-button" reel.

**Spool** The part of a reel that stores the fishing line.

**Spool Release Button** The button on a spin-cast reel that is depressed and released to cast the plug or bait. This button allows line to peel off from the spool.

**Sport Fishing** Fishing for recreation and not for profit or commercial reasons.

**Stance** A fundamental of accurate casting where the caster's feet are correctly positioned.

**Steaking** A method of preparing fish for cooking. The steaks are made by cutting about one-inch slices through the fish's body.

**Stiff Action** A rod action sometimes referred to as "heavy action." This action, when under maximum load or bend, results in all the curve of the rod taking place only in the upper 10-20 percent.

**Still Fishing** A method of sport fishing that involves casting bait to a likely spot and waiting for a fish to bite. Two main types of still fishing are "tight-line" and "bobber" fishing.

**Structure** Anything in or around water that provides some form of shelter for fish or attracts food fish.

**Structure Fishing** A strategy of sport fishing that involves locating fish by understanding their needs and seeking out water that answers those needs.

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**Equipment sources**

Fishing equipment, visual aids, and handouts are available to help instructors conducting fishing classes. Materials usually can be obtained with a bit of resourcefulness and some letter writing.

A good source is the AFTMA, which stands for the American Fishing Tackle Manufacturers Association. AFTMA maintains a free film loan library, has handouts available, and can help in obtaining equipment to use in classes. Their address is:

AFTMA
2625 Clearbrook Drive
Arlington Heights, IL 60005

Another good source is the manufacturers themselves, many of whom realize that promoting fishing is promoting their equipment. They are willing to help instructors who write to them requesting information. Most companies have a promotional or advertising department to which letters should be addressed, and addresses are available from stores selling the equipment. Local stores or retail outlets that sell fishing equipment are sometimes good sources too.

Fishing equipment can sometimes be obtained through donations or by borrowing it. If equipment is purchased, most companies offer educational group prices.

Zebco publishes an instructor packet called "Fishing A to Z," which contains an instructor guide, student booklet, film list, four wall charts on equipment nomenclature and fish identification, and score cards for casting contests. The packet also contains a post card which can be used to order student books at no cost. Zebco also may donate rods and reels or sell them at reduced prices to educational programs.

For more information, write:

Zebco Division Brunswick Corporation
Attn: Ad Service
P.O. Box 270
Tulsa, Oklahoma 74101

The Missouri Department of Conservation's Outdoor Skills Education Unit maintains a limited supply of equipment and visual aids to help new programs get started. Workshops are conducted which provide training in how to teach casting and angling. Names and addresses of Outdoor Skills Specialists are listed in the back of the module.

# Appendix 1—Skill Test

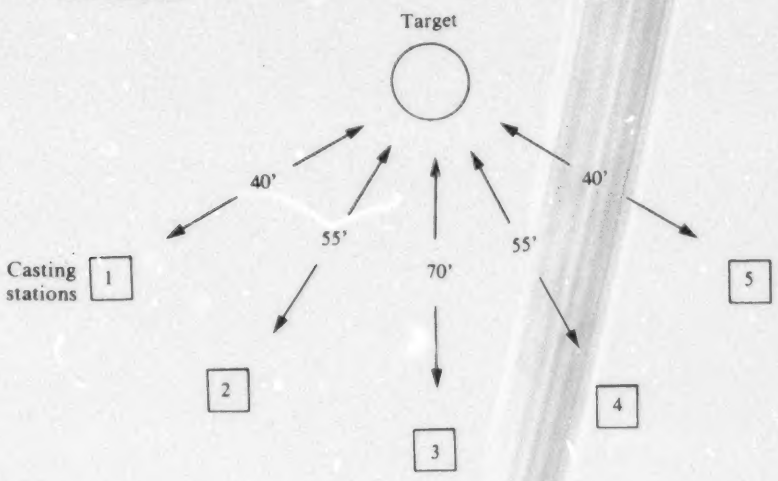
**Facilities:** Gymnasium or playground

**Logistics:** One 30-inch diameter casting target and 5 casting stations are arranged in the manner illustrated.

The five casting stations can be marked with tape on a gym floor; paint or powdered chalk can be used on a playground.

**Test administration:**

1. Have five students, with rod and reels, position themselves in one of the five casting stations.
2. As instructor, you assume a position down range and a few feet to one side of the target.
3. Instruct student on station #1 to cast at the target.
4. Mark where the plug lands and score the cast.
5. Tell student on station #2 to cast.
6. Mark where the plug lands and score the cast.
7. Repeat this process until all five students have made their first cast.
8. Now repeat the entire process again until the five students have made their second cast.
9. After two casts, ask students to move one casting station to their right, with the student on station #5 moving to station #1.
10. Continue to repeat this process until each of the five students casts twice at each station.
11. Now bring five new students to the casting stations and administer the skill test to them in the same manner.
12. Repeat the entire process until all students in the class are tested.




**Note to Instructor:**

*You do not need to measure each cast with a tape measure, since this might slow the testing to an unmanageable point. Watch closely where the plug lands and estimate the distance.*

*Another method that can be used is to fasten a swivel eye-bolt in the center of the target. Then fasten to the eye-bolt a cord or rope marked in one-foot intervals from the outer edge of the target, out to 10 feet. This allows a rather quick and accurate means of measuring and scoring each cast.*

*Should you prefer to use floating target rings in a pond or swimming pool to administer the test, you will have to estimate each cast for scoring purposes.*

**Scoring:** Each student starts with 100 points. From this, subtract a demerit point for each full or partial foot a given cast misses the target. No more than 10 demerit points may be subtracted for any one cast. Any cast hitting or landing inside the target results in no point subtraction.

**Examples**

**SCORE SHEET**

| Name | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| John | 2 / 98 | 10 / 88 | | | | | | | | | |
| Mary | 0 / 100 | 1 / 99 | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | Team Score | |

John's first cast lands 15 inches from the target. John loses 2 points, so his running score in now 98.

Mary's first cast hits the target. Mary loses no points so her running score remains 100.

John's second cast lands 16 feet from the target. John loses 10 points, so his running score is now 88.

Mary's second cast lands 6 inches from the target. Mary loses 1 point, so her running score is now 99.

See score sheets on page 105.

# Appendix 8—Plug Golf

**Introduction:** Plug Golf was first played by Dr. Harlow Metcalf at State Teachers College, Cortland, New York. A fun skill game, it gets its name for being based on golf. The original plug golf game has been modified many times to meet specific class needs. You may need to change certain rules to fit your particular situation.

**Layout of course:** Plug Golf is usually played on a nine-hole course, consisting of nine tee areas and nine target/green areas. The course can be laid out anywhere space permits. Football or softball fields work well.

**How to play:** Players cast from a specified tee area. The first cast is usually a distance cast. For example, if hole #1 is 120 feet from the tee, the first cast will be made to get as close to the green area as possible. The player walks to where the practice plug landed, retrieving line as he goes. The second cast is made from this spot, provided it is not yet on the green area. If the cast does land on the green area, the player walks to the green area line (which on hole #1 is 30 feet from the target) and all remaining casts at that target must be made from this line. The player continues to cast until he hits the target or makes 10 casts at that hole's target. Thus, the maximum score a person can get on any target is 10.

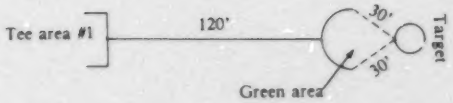
Remember that no casts are made from in front of the green line. Once a player's plug crosses the green area line, all remaining casts at that target are made from behind the line.

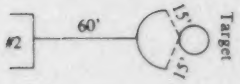
Players play through the course in groups of four. Each player keeps his own running score. The instructor can establish a par value for each target. Both team and individual scores can be kept.

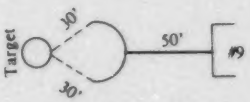
Always stress safety. Never cast toward another person.

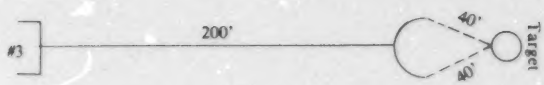
**Typical plug golf course:**

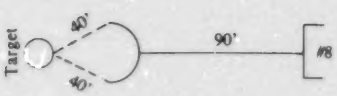
Targets are 30 inches in diameter.
Tee and green areas are marked with chalk lines or flags.

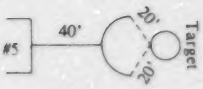


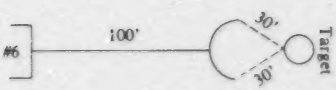







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# Appendix 3—Practical Casting

**Introduction:**

Practical casting is similar to field archery. It puts the player in realistic situations where a special cast or technique is required.

The course itself can be set up indoors or out, but outdoors requires less set up. The course can be as varied or difficult as the instructor desires. Students work through the course in groups of four.

**Layout of course:**

The course should consist of at least 5 targets, with 10 targets being the ideal number. Targets are at least 30 inches in diameter and no more than 48 inches.

**How to play:**

Each player gets a maximum of three casts per target. All casts must be made from behind the casting line.

A player hitting the target on the first cast receives five points.

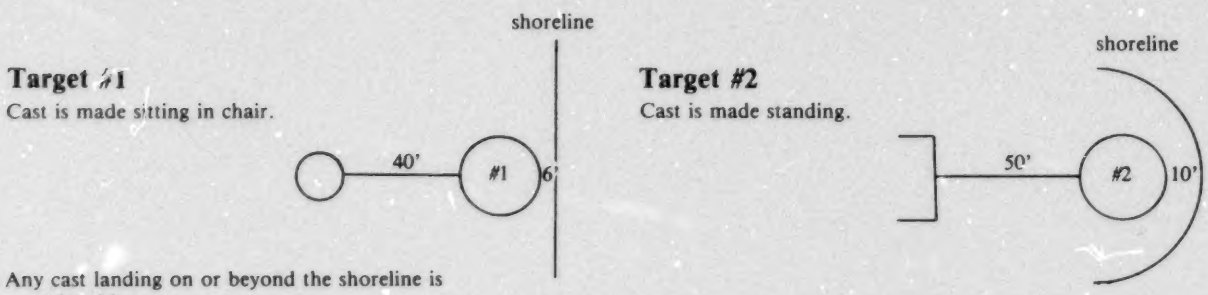
A player hitting the target on the second cast receives three points.

A player hitting the target on the third cast receives one point.

A player is considered to be "hung up" if a cast lands on or goes beyond the designated shoreline. If this happens, the player loses three points and may not cast at that target again.

**Typical practical casting course:**

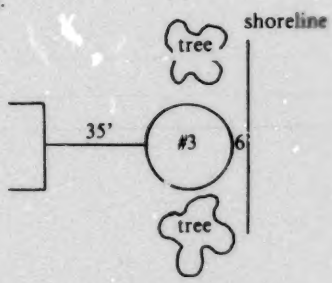
Any cast landing on or beyond the shoreline is considered hung up.




Any cast landing on or beyond the shoreline is considered hung up.

## Target #3

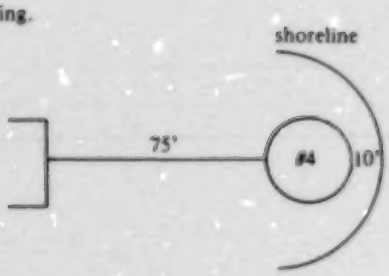
Cast is made standing.




Trees should have branches that extend over part of the target. High jump standards, volleyball standards, or other equipment can be used in place of trees, as long as a branch, crossbar, or other object extends over part of the target. The branch ideally should be about 6 feet over the target.

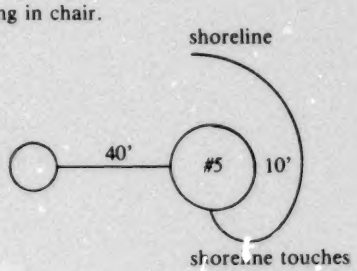
## Target #4

Cast is made standing.



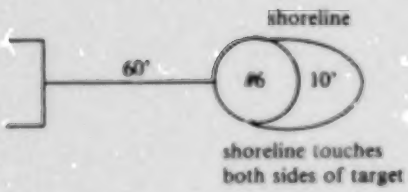

## Target #5

Cast is made sitting in chair.



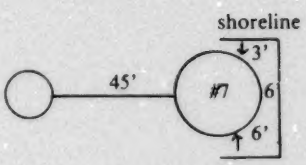

## Target #6

Cast is made standing.



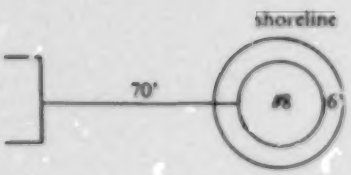

## Target #7

Cast is made sitting in chair.



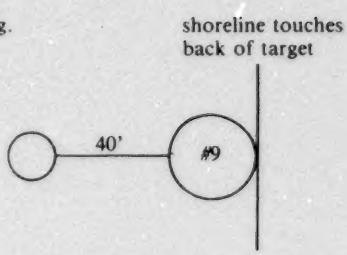

## Target #8

Cast is made standing



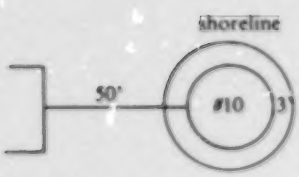

## Target #9

Cast is made sitting.




## Target #10

Cast is made standing.

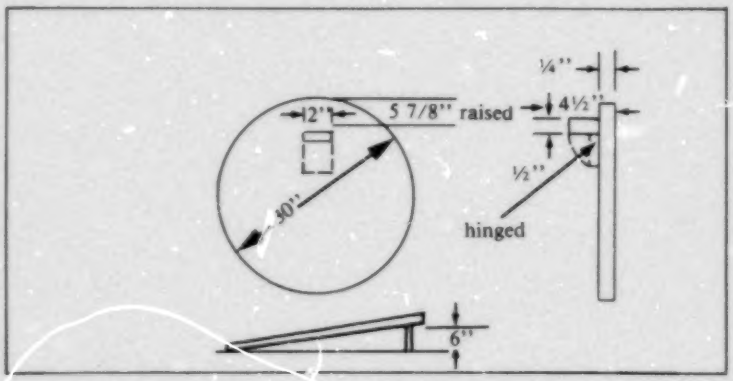



**Target size can be varied to increase and decrease skill level.**

## Appendix 4—How To Make Land Targets

**Materials:** 1/4-inch exterior plywood
hinged peg for convenience in handling and storing

**Recommended colors:** Red, white, blue, green, and yellow



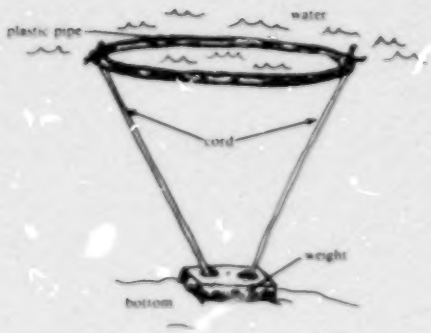

*Design by C. L. Netherton*

## Appendix 5—How To Make Floating Water Targets

**Materials:** To make an easy inexpensive floating casting target, use one-inch diameter orangeburg plastic water pipe. The pipe comes in 100-foot rolls or can be purchased by the foot. Most hardware and building supply stores handle it. You also will need a one-inch connector for each target.

It takes an 8-foot section of pipe and one connector to make a target that is 30 inches in diameter.

**How to make:** Bend the two ends of the 8-foot section together, forming a circle. Using the connector, connect the two ends to form a 30-inch ring. The ring can now be painted. Commonly used colors are white, yellow, orange, and red. Light colors show up best when floating on water.




Floating targets must have a weight. Using nylon cord, run one end through a weight and tie it to the ring. Now lower the weight till it rests on the bottom of the lake, pond, or pool. Tie the loose end of the cord to the ring directly across from the other tie. Cut off excess cord.

The weight must rest on the bottom to keep the ring from drifting. Weights can be red bricks with holes in them or a piece of 1- to 2-inch diameter galvanized pipe about 1 or 2 inches long.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**Specialists' Regions**

Outdoor Skills Education Specialists and Education Consultants will assist you in obtaining materials and scheduling equipment and films that are available from the Department of Conservation. They also offer workshops to provide training in outdoor skills and conservation education.

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*Lake City Training Center and Range*
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Brywood Shopping Center
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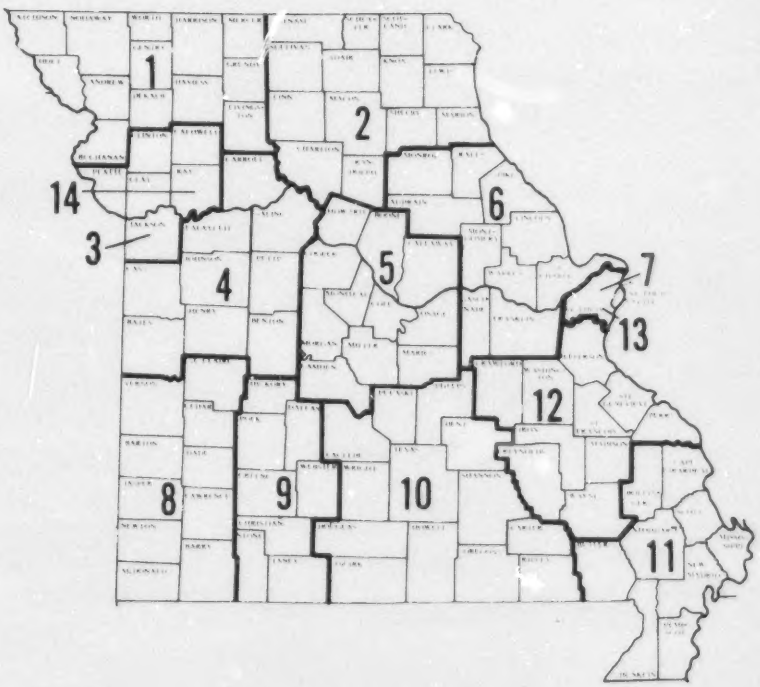
*District 14*
Temporarily refer requests
to Neil W. Jenkins
(District 3)

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